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24 August 1982

## USSR REPORT MILITARY AFFAIRS

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### CONTENTS

#### MINISTRY OF DEFENSE AND GENERAL STAFF

- Marshal Vasilevskiy on Leadership During War Years  
(SU A.M. Vasilevskiy; NOVAYA I NOVEYSHAYA ISTORIYA, Mar-Apr 82) 1

#### ARMED FORCES

- Table of Contents of 'KOMMUNIST VOORUZHENNYKH SIL', No 12, June 1982  
(KOMMUNIST VOORUZHENNYKH SIL, Jun 82) ..... 17
- Stress on Implementing Armed Forces Party Conference Recommendations  
(KOMMUNIST VOORUZHENNYKH SIL, Jun 82) ..... 19
- Outline for Indoctrination on Lenin, Armed Forces  
(A. Skryl'nik; KOMMUNIST VOORUZHENNYKH SIL, Jun 82) ..... 28
- Review of Book on Urgent Problems of Scientific Communism  
(V. Khalipov; KOMMUNIST VOORUZHENNYKH SIL, Jun 82) ..... 42
- Follow-Up Report on Press Coverage  
(KRASNAYA ZVEZDA, 28 Apr 82) ..... 46
- Military Innovators, Inventors Cited  
(V. Reznik; KRASNAYA ZVEZDA, 28 Apr 82) ..... 47
- Editorial Keyed To Increased Vigilance  
(Editorial; KRASNAYA ZVEZDA, 4 May 82) ..... 51
- April Mailbag Reviewed  
(KRASNAYA ZVEZDA, 4 May 82) ..... 54
- Sorokin on Military Press  
(A. Sorokin; KRASNAYA ZVEZDA, 5 May 82) ..... 56

## AIR FORCES

Flight Training: Effects of Party Influence Discussed (L. Batekhin; KOMMUNIST VOORUZHENNYKH, Jun 82) .....	61
Operations of Aircraft Against Ships at Sea Discussed (I.I. Kolosov; MORSKOY SBORNIK, Mar 62) .....	70
Locating Ships at Sea by Aircraft Crews (P.N. Yarushev; MORSKOY SBORNIK, Aug 62) .....	78
Modern Means of Air Navigation for Flights Over Water (G. F. Molokanov; MORSKOY SBORNIK, Sep 81) .....	89
Use of Navigation Systems for Air Flights (N. G. Rachkovskiy; MORSKOY SBORNIK, Dec 61) .....	96

## NAVAL FORCES

Use of Scientific Methods in Operations Research (N. I. Nikol'skiy; MORSKOY SBORNIK, Jun 62) .....	111
Evaluating Effectiveness of Designed Ship (Yu. V. Skorokhod; MORSKOY SBORNIK, Dec 61) .....	123

## LOGISTICAL SERVICES AND SPECIAL TROOPS

Chemical Defense Troops Discussed (KRASNAYA ZVEZDA, 1 Jul 82) .....	132
--	-----

## PERCEPTIONS, VIEWS, COMMENTS

Comments on Activities of U.S. in Indian Ocean Area (Yu Sedov; KOMMUNIST VOORUZHENNYKH SIL, Jun 82) .....	135
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MINISTRY OF DEFENSE AND GENERAL STAFF

MARSHAL VASILEVSKIY ON LEADERSHIP DURING WAR YEARS

Moscow NOVAYA I NOVEYSHAYA ISTORIYA in Russian No 2, Mar-Apr 82 (signed to press 3 Mar 82) pp 74-86

[Article by Mar SU A. M. Vasilevskiy: "Memoirs: Supreme High Command Headquarters (Stavka) and Leadership of the Armed Struggle During the Great Patriotic War"\*]

[Text] The Great Patriotic War holds a special place in the history of the Soviet state and of its Armed Forces. This war was the largest military clash between socialism and the shock forces of international imperialism and the most difficult and merciless of all wars ever experienced by our Motherland. It was an unprecedented, fierce test of all our country's material and nonmaterial forces, the most severe test of the combat qualities of the Red Army and Navy throughout their existence.

Events of the Great Patriotic War are departing further and further into the depths of history, but time holds no sway over people's hearts. The glory of heroic deeds of the Soviet people and their Armed Forces and the memory of exploits and courage of those who defended the socialist Motherland, saved the world from fascist enslavement and defended mankind's bright future live there and always will.

The guiding and organizing activities of the Communist Party were the primary source of the world-historic victory over fascism. The CPSU CC Decree entitled "On the 30th Anniversary of the Soviet People's Victory in the Great Patriotic War of 1941-1945" noted: "It was able to mobilize the Soviet people for the sacred struggle against fascist invaders under exceptionally difficult conditions, and despite temporary setbacks during the war, was able to ensure its victorious conclusion."<sup>1</sup> Throughout the war the Communist Party of the Soviet Union was a fighting party. Its monolithic unity with the people was a prime factor in the world-historic victory.

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\*From the military science heritage of Mar SU A. M. Vasilevskiy, who was Chief of the USSR Armed Forces General Staff during the war years, commander of the 3d Belorussian Front, and CIC of Soviet Forces in the Far East. The memoirs were prepared for printing by Doctor of Historical Sciences, Professor G. A. Kumanev.

The Great Patriotic War touched all aspects of the Soviet state's life. It was necessary to rally the people, skillfully manage armed struggle unprecedented in scope and the country's enormous, complex economy, and reorganize it while subordinating it wholly to the war. It was necessary to become well oriented in the world situation, not lose heart over the failures of the war's beginning and keep up faith in victory in the people. In thinking about all this one experiences a feeling of pride in our party.

A blow of enormous force fell on the USSR in the first days of the war. The army of fascist Germany and its satellites, stupefied by the poison of chauvinism and racism, mobilized fully and possessing the experience of combat operations in the West, at that time surpassed our country's Armed Forces participating in the fighting both in numbers and in weapons, and on the axes of the main attacks this superiority was a multiple one. Nevertheless, in the final account the enemy's plans failed and his military adventure ended in collapse.

Proper organization of control of the Soviet state was of exceptionally great importance for assuring the enemy's defeat. In resolving this issue of very great importance to the country, the Communist Party proceeded from the Leninist principle of centralization of political, military and economic management at a particularly intense moment, developed back during the Civil War and grounded on a combination of collective leadership with a strict personal responsibility.

Only an entity such as the State Defense Committee (GKO) headed by I. V. Stalin and formed in the very first days of the war could implement the policy outlined by the Communist Party, determine correctly and precisely the scope and nature of political, economic and military tasks of which the country and its Armed Forces were capable in a concrete period of the war, and mobilize and best utilize all possible forces and means for accomplishment of these goals and missions. Absolute power and management of all activities of the country and its Armed Forces in the struggle against the crafty enemy was concentrated in the GKO's hands.

Soviet citizens--those who were destined to strike down the hated enemy with guns in hand directly at the war fronts, those who forged this victory at the labor front by their heroic efforts, and those who knew all the horror of fascist enslavement and later the great joy of liberation--remember well and never will forget the enormous role played by the Communist Party, its CC and the State Defense Committee in organizing the victory. Many of them were witnesses of the titanic work and unbelievable efforts expended by the CC Politburo and GKO in carrying out what seemed to be absolutely impossible assignments in scope and deadlines under very difficult conditions.

From the very first minutes of the war the primary attention of the Communist Party and Soviet government was directed at reinforcing and increasing the combat might of the Red Army and Navy, at converting the economy to a wartime footing and at mobilizing all forces and means for defeating the enemy. The Armed Forces were assigned the mission of defending every inch of native soil, fighting for cities and villages to the last drop of blood, exhausting and rendering the fascist German forces lifeless in defensive fighting, and then

routing and destroying them. While implementing a program for mobilizing the country's efforts for the struggle against the fascist aggressor, the party performed an enormous amount of organizational and political work aimed at a comprehensive strengthening of the USSR's Red Army and Navy. Regular troops at the front received urgent replacements by decision of the GKO. New troop units and combined units were formed and major strategic reserves were created, armed and trained. Organizational measures were conducted both among the troops and in the entities controlling them, including the General Staff and USSR Narkomat [People's Commissariat] of Defense. Partisan combined units were set up in the enemy rear and direction of the nationwide struggle on Soviet soil temporarily occupied by the Hitlerites was perfected.

The Red Army grew stronger from day to day as a result of these efforts and the measures conducted. Its strength of resistance to the enemy rose and this forced him to give up a general offensive being waged across the entire Soviet-German Front and temporarily assume a defense as early as the fifth month of the war.

At this time the VKP(b) [All-Union Communist Party (Bolshevik)] CC, the GKO and the USSR Sovnarkom [Council of People's Commissars] also were forced to resolve a number of other urgent state tasks in parallel. For example, in the situation existing after the surprise enemy attack it was necessary to rebase hundreds of the largest industrial enterprises and evacuate millions of Soviet citizens from the country's west to the east in the shortest possible time. This very difficult task, which played an exceptional role in organization of the victory over the enemy, was successfully accomplished through the efforts of the party and the entire Soviet people.

Leadership of the Armed Forces also was up to tasks advanced by the war and defined by the party and government. In mentioning this we should speak above all of the enormous role played throughout the war by the High Command Headquarters set up by the Communist Party (the Supreme High Command Headquarters as of 8 August).

This was a very effective entity for strategic leadership of the Armed Forces, which received due historical recognition. The Supreme High Command (VSK) Headquarters bore full responsibility to the party Central Committee and the State Defense Committee for the course of armed struggle at the fronts, for troops' combat effectiveness and for the work of all higher military cadres and did an enormous amount of work during the war under party direction.

It was small in composition, with all its members simultaneously performing their primary official duties. The work of the Supreme High Command Headquarters was organized in a special manner. In order to work out a particular operational-strategic decision or to examine other important problems of the armed struggle, the Supreme Commander would summon responsible persons who had a direct relationship to the question being examined. There might be members or nonmembers of the VSK headquarters, but without fail there would be Politburo members, leaders of industry and commanders summoned from the front. Everything developed in the Supreme High Command Headquarters with mutual consultations and discussions immediately would be formulated as its directives. The Supreme High Command Headquarters did not adhere to any kind of stereotypes, but would seek out and apply the most expedient work forms in each concrete instance.

It is generally known that at the beginning of the war, when command and control was extremely difficult, the Supreme High Command Headquarters would exercise strategic leadership through the supreme command of sectors. When the situation at the fronts began to assume more or less stable forms, the supreme commands of sectors were abolished in succession and the Supreme High Command Headquarters assumed direct leadership of the fronts. With the conduct of major offensive operations by forces of several fronts beginning in 1942 the Supreme High Command Headquarters would resort to the help of its representatives whom it would send to conduct these operations and coordinate front actions and subsequently to exercise leadership over the fronts. The number of fronts operating separately decreased and the need for forming intermediate levels of strategic leadership disappeared in the final year of the war when the extent of the entire Soviet-German Front line was cut sharply.

As a rule the strategic decisions for conduct of operations drawn up and made collectively by the Supreme High Command Headquarters always responded to the concrete situation existing at the fronts and so were received quickly, easily and correctly by the command element and troops, and the requirements the Supreme High Command Headquarters placed on persons responsible for execution were realistic.

Practical leadership of the armed struggle was exercised by the Supreme High Command Headquarters throughout the war through the General Staff, which was its primary working entity, as well as through the Armed Forces Rear, the main and central directorates of the Narkomat of Defense and the Navy, and through the command element of corresponding fronts and fleets. Along with the Supreme High Command Headquarters, the General Staff was the brain of the Armed Forces. Inasmuch as the war had no equal in history, the General Staff received work of exceptional complexity and colossal in scope.

The General Staff was obligated not only to know everything which occurred over the enormous expanse of military actions, but also direct and monitor it skillfully in accordance with strategic decisions. Everything had to be considered: friendly and enemy forces, the enemy's most probable plans, his favorite tactics, the troops' morale, and capabilities of friendly and enemy military leaders. One had to know what we had in reserve and what the enemy had at this same time; know what the rear could give the front; and skillfully organize the delivery of everything necessary to the necessary place and by the necessary dates. It also should be considered that all work took place under conditions of a continuously changing situation and where the enemy was placing his will and his plans in opposition.

The entire flow of war information also was summarized and thoroughly analyzed in the General Staff. It was briefed to the Supreme Commander in a compressed form twice a day. The Supreme High Command Headquarters would make its important and responsible decisions based on this information.

The important element in the Supreme High Command Headquarters' work of strategic leadership of military actions was to surpass the enemy in all indicators of the military art. It thus represented a concentration of military thought, military experience, military wisdom and initiative. As noted

correctly by Mar SU G. K. Zhukov, the Supreme High Command Headquarters saw further and better, and its strength lay in the detailed and more serious scientific forecast of the development of events at the fronts.

The summer and fall of 1941 was the most difficult period of our struggle against fascism. The enemy placed not only the entire military and economic might of the fascist state and its allies, but the experience of several years of war in Europe as well into his offensive across an enormous front from the Baltic to the Black Sea.

At that time, however, we lacked not only forces and means, but also the ability to conduct modern combat actions against the strongest army of the capitalist world, armed to the teeth. The Red Army was retreating while conducting difficult defensive fighting. Not one inch of soil was given to the enemy without a fight. Every step forward cost the Hitlerites enormous losses and undermined the might of the fascist army. The Red Army ground down and exhausted more than one group of ten enemy divisions in fighting at Lutsk, Brody and Rovno, during the heroic defense of Odessa and Sevastopol', and at Leningrad and Smolensk. Fighting men and commanders displayed unprecedented determination and heroism and gave their lives in unequal fighting against a strong and cruel enemy in the first period of the war. The party members moved in front. It was the courage of these heroes, the majority of whom remained unknown and who often literally shielded the homeland with their chests, that allowed not only winning time for organizing a rebuff of the enemy, but also recognizing and correcting certain mistakes in leadership of military operations.

It probably will be apropos here to quote the testimony of Hitler General K. Tippelskirch, who at the beginning of the war was chief of the main intelligence directorate of the Ground Forces General Staff. "This was an enemy with a steel will. . . . The Russians fought with unexpected firmness and determination, even when they were enveloped and surrounded. They thus gained time and drew up more and more reserves out of the country's depths for counterblows; reserves which moreover were stronger than assumed."<sup>2</sup>

The determined resistance of Soviet forces was one of those factors not taken into account by Hitler's command element and which marked the beginning of the failure of the blitzkrieg against the Soviet Union. This meant that those social and economic conditions which comprised the might and invincibility of the Soviet land were beginning to acquire more and more importance.

The USSR Armed Forces succeeded in standing up honorably under a difficult test in battles of the initial period of the war and disrupting the adventurous blitzkrieg plan. In early winter of 1941 the fascist German army suffered the first major strategic defeat in World War II at Moscow. The Red Army took the strategic initiative into its own hands. Despite the commitment of serious strategic reserves, our troops carried out the historic counteroffensive of the Soviet Armed Forces without any kind of numerical superiority over the enemy. To the contrary, at the Western Front where we delivered the main attack the enemy even surpassed Soviet troops in personnel, artillery and tanks. The Red Army's moral-combat superiority played an enormous part in the success of the counteroffensive at Moscow thanks to the Communist Party's

daily, purposeful ideological and mass political work conducted among the Soviet military personnel. The people's degree of readiness to overcome the hardships of armed struggle under the difficult climatic conditions proved to be different in the warring armies. It was not by chance that the Hitlerite Army did not attempt to undertake a winter offensive a single time during the combat actions at the Soviet-German Front. Only Red Army forces with their high morale and fighting enthusiasm were able to conduct winter offensive operations successfully.

The historic victory in the Battle of Moscow, which became a triumph of the Soviet Armed Forces, was the most important event not only in the Great Patriotic War, but of the entire World War II. Defeat of the Hitlerites at Moscow victoriously concluded the first and most difficult phase of struggle on the path to complete and final victory over fascism.

The second year of war was an important historical stage on the path to final victory over the enemy. Taking advantage of the absence of a second front in Europe, Hitler's strategists, no longer having an opportunity to deliver attacks on several axes as was the case in 1941, were able to unfold a major offensive in the summer of 1942 only in the southern part of the Soviet-German Front. They were pursuing the very same political goals under the notorious plan "Barbarossa" which they failed to achieve in 1941.

The Soviet Supreme High Command and General Staff assumed that the enemy would try to deliver an attack in the summer of 1942 on the Moscow Axis, as in 1941, and so our main body was here until the summer of 1942. But information coming to the General Staff and Supreme High Command Headquarters about the Hitlerites' formation of a troop grouping to the south of our front was evaluated as the enemy's intention to undertake a secondary diversionary attack there. It was decided to disrupt this attack by a preemptive offensive of troops of the Southwest Axis. The Soviet troop offensive successfully begun here in the first half of May was halted, since the move of the enemy main grouping into the counteroffensive against weak forces of our Southern Front created a threatening position not only for troops of the Southern Front, but also for the main body of the Southwest Front. As a result of this unsuccessful operation troops of fronts of the Southwest Axis suffered a serious defeat and were forced again to repulse attacks by major enemy forces and withdraw from line to line into the depth of the country while conducting bloody fighting.

The enemy again seized the strategic initiative. In the final account, however, although he succeeded in penetrating to the Volga near Stalingrad and moving to the passes of the Main Caucasus Range, this enemy offensive nevertheless ended in failure for him thanks to the serious measures taken by the Supreme High Command Headquarters. Here too Soviet troops led by the Supreme High Command rendered the enemy lifeless in defensive battles and created necessary conditions for moving into a resolute counteroffensive.

The second strategic offensive by the Soviet Armed Forces began in November 1942. The heroic defenders of Stalingrad, who for four months fought with unprecedented steadfastness in the thoroughly demolished city, paralyzed the enormous enemy shock grouping. At times it seemed that such a serious

situation was forming for Soviet troops that it was absolutely impossible to defend. But despite the enormous superiority in personnel and means, the enemy still was not able to break the defenders of the unsubdued city. In mid-October the German command was forced to issue an order on assumption of a defense. The troops were ordered "to hold the lines which had been reached no matter what, repulse all attempts on the enemy's part to penetrate them and thus create preconditions for continuing . . . the offensive in 1943."<sup>3</sup> It was asserted further that "the Russians were seriously weakened during the latest fighting and will not be able to have the very same large forces in the winter of 1942/1943 which they had last winter."<sup>4</sup>

The enemy again made a fatal mistake. Despite the losses suffered, the Soviet Armed Forces had grown considerably stronger by the fall of 1942. High-capacity war production had been organized by that time thanks to the titanic work of the Communist Party and enormous efforts by toilers of the rear. The production of T-34 tanks, aircraft of new designs, guns and automatic weapons increased. Troop organizational structure improved on this material basis. An opportunity arose for beginning major offensive operations as early as the winter of 1942/1943.

The Supreme High Command Headquarters knew full well that thanks to the steadfastness and determination of heroes of the Volga Fortress, the German 6th Army and part of the forces of the 4th Panzer Army were concentrated in a narrow sector of the front immediately in the vicinity of the city and their flanks were screened by Romanian troops. The decision suggested itself: to organize and conduct a counteroffensive, and one which not only would change the situation here radically, but would lead to the downfall of the southern wing of the enemy front still functioning vigorously. This point of view took shape in mid-September after an exchange of opinions among I. V. Stalin, G. K. Zhukov and me. The essence of the strategic plan came down to delivering powerful attacks against flanks of the enemy grouping from areas northwest and south of Stalingrad in the general direction of Kalach and encircling and destroying its main body.

In preparing this grandiose operation the Supreme High Command had to resolve a multitude of very difficult problems, the majority of which it was encountering for the first time. The Soviet command boldly applied the principle of mass employment of forces on decisive axes, which had not been done for example in planning the winter campaign in early 1942 when reserves were evenly distributed among all strategic axes.

It is customary in military affairs to distinguish two kinds of superiority in forces and means: overall superiority and superiority on the main axes. It is of course always desirable to have a substantial preponderance over the enemy in personnel and means, but the situation did not permit the Soviet Supreme High Command to achieve that preponderance by the beginning of the counteroffensive. Here is how the relative forces and means of the opposing sides appeared on the Stalingrad Axis as of 19 November 1942. Soviet troops: personnel--1,103,000; guns and mortars--15,501; tanks and assault guns--1,463; warplanes--1,350. Enemy troops: 1,011,500, 10,290, 675, and 1,216 respectively.<sup>5</sup>

But the Soviet command was able to skillfully create powerful groupings on axes of the main attacks. For example, up to 50 percent of rifle divisions, all tank and cavalry corps and 85 percent of the artillery were concentrated in the 22 km wide breakthrough sector of the Southwest Front (around nine percent of the overall extent of the front).

The performance of such a very complicated operational maneuver as an attack along converging axes for the purpose of encircling an enemy grouping demanded great proficiency, a high degree of professional culture and broad creative thinking on the part of Soviet military leaders. The majority of them coped with the difficult task. Soviet military art won a significant victory at Stalingrad. A trap was set for the fascist beast skillfully and coolly. An enormous amount of equipment and almost a third of a million enemy personnel ended up in the trap. While the Hitlerite command managed to withdraw a portion of its forces at Moscow, this time its main strategic grouping was almost completely eliminated--only the remnants of 16 of its 50 divisions avoided destruction. The fascist German Army had never yet known such a catastrophic defeat.

After Stalingrad and especially in the third period of the war the attack along converging axes and encirclement of major enemy groupings became the predominant form of strategic operations by Soviet forces. The Korsun'-Shevchenkivskiy, Jassy-Kishinev, Belorussian, Berlin, Prague and Manchurian operations were conceived and implemented in this manner.

The victory at Stalingrad gave the Soviet nation new emotional forces. We had no doubt in our victory even in the most difficult months of the first period of war, but now this confidence rested on our increased combat might and the ability to fight. We sensed that we could and would defeat the enemy and that we had mastered the techniques of conducting modern, maneuverable warfare. The decisiveness and boldness of strategic plans now were backed up not only by the combat proficiency of Soviet soldiers, but also by our Army's logistical support. While the Hitlerite army suffered irreplaceable loss (it no longer could counter the Red Army with that number of troops which Germany had at our front by the fall of 1942), our Armed Forces were receiving more and more guns and mortars, tanks, aircraft and other armament of the most modern models with each passing month. All this led to a change in relative strengths and to that fundamental turning point in the armed struggle, the beginning of which was marked by the Soviet troops' victory at the walls of Stalingrad.

Naturally not everything went smoothly in improving the strategic leadership. Because of mistakes made by our command element in the spring of 1943 the Hitlerites managed to press the Soviet troops in the Donbass and on the Khar'kov axis. We also were not able to interdict the withdrawal routes of the enemy's North Caucasus grouping. But these shortcomings differed from those which we failed to avoid in the first year of the war. These were mistakes of growth, if it can be thus expressed.

The fundamental turning point in the course of the war concluded with the Red Army's strategic offensive in the summer-fall campaign of 1943. Its chief event was the defeat of the powerful enemy grouping operating in the Kursk-Orel sector of the front.



This grandiose battle began with the deliberate defense of Soviet forces. Success of military operations, particularly of a strategic defense, depends largely on prompt determination of those axes on which the enemy was concentrating the main body for delivery of an attack. We did not master this art all at once.

In our view the events of the summer of 1943 in the vicinity of the Kursk Bulge attest most eloquently to how important it is to divine the enemy's plan, prepare to repulse his attack and make the enemy's combat activeness become a condition for his defeat. By this time the ratio of forces and weapons at the Soviet-German Front had changed in favor of the Red Army. Its troops in the field already had a certain numerical superiority and had more tanks and guns than the enemy. The Soviet command was planning a major offensive on the Southwest Axis, but our intelligence succeeded in uncovering in a timely manner the Hitlerite army's preparation for a major offensive in the Kursk Bulge and even managed to determine its date.

The Soviet command was faced with a dilemma: attack or defend? Collective reason and the imaginative work of experienced military leaders made wise by two years of war, from the front level to the Supreme High Command, helped make the only correct decision. In analyzing intelligence on the enemy's preparations for an offensive, the fronts, General Staff and Supreme High Command Headquarters gradually inclined toward the idea of assuming a deliberate defense.

On the evening of 12 April 1943 a conference was held in the Supreme High Command Headquarters attended by I. V. Stalin, Deputy Supreme Commander G. K. Zhukov, Deputy Chief of the General Staff A. I. Antonov and me. A preliminary decision was made for a deliberate defense. Stalin was worried over whether or not our troops would withstand an attack by large masses of fascist tanks. The fact was that to carry out Plan "Citadel" the Hitlerite command concentrated up to 70 percent of all its tank divisions in narrow sectors for penetrating the Soviet defense. But the Red Army had been tempered in battle, had acquired enormous combat experience and had excellent weapons. Now it was the fascists who feared us. The vacillations were cast aside.

A careful analysis of the situation and foresight into the development of events permitted drawing a correct conclusion: Main efforts had to be concentrated to the north and south of Kursk, at the base of the bulge; render the enemy lifeless here in a defensive battle; then assume a counteroffensive. A multizone defense 250-300 km deep was set up on the Kursk axis. A powerful strategic reserve--the Steppe Front--was advanced to an area east of Kursk. The largest concentration of supplies and forces during the entire war was carried out at Kursk. Military councils, commanders and political entities of formations and combined units conducted much work in preparing troops for offensive fighting. They developed high political awareness, steadfastness, courage and deep patriotism in the soldiers. As a result of the Communist Party's enormous work, personnel of the army in the field were prepared in the moral-political and psychological respects for the summer and fall battles of 1943.

And although the enemy's shock groupings, which had a large number of tanks, attacked on a narrow front, they were not able to penetrate our defense on a single axis. The last strategic offensive of the fascist Germany army continued about a week and ended in failure on 12 July. It bogged down in an unprecedented short period of time (12-15 days), with not even operational success having been achieved.

And immediately the Bryansk and Western fronts delivered a surprise strike against the enemy's Orel grouping. The Central Front joined in the counter-offensive on 15 July. This was the beginning of implementation of Plan "Kutuzov." As a result the enemy's Orel base of operations had been eliminated by 18 August and the fascist forces operating there had been routed.

The counteroffensive on the Belgorod-Khar'kov Axis by the Voronezh and Steppe fronts with the assistance of the Southwestern Front (Operation "Rumyantsev") began on 3 August. It concluded with the enemy's total defeat and the liberation of Khar'kov.

The counteroffensive by our armies immediately after very difficult defensive fighting was unexpected by the enemy and was a great achievement of Soviet strategy. The proper selection of the time for the troops to move into the offensive and a precise determination of axes of main attacks, brilliantly accomplished back in the Battle of Moscow, after the Kursk victory became inalienable qualities of the Soviet military art. Thanks to a prompt concentration of strategic reserves Soviet troops usually would move into an offensive even before the fascist German command became convinced of the impossibility of continuing offensive actions and managed to take steps for a strong consolidation of the lines it held. The Soviet command's ability to determine correctly the moment of crisis of an enemy offensive and to take advantage of this favorable opportunity most effectively for retaliatory attacks was vivid proof of the progressive development of our strategy.

In evaluating results of the Battle of Kursk, one can say with all obviousness that we not only won a major battle, but we ourselves also developed in it. Our concepts in drawing up a plan for the summer campaign were justified and we learned to divine the enemy's intentions. We had sufficient will, character and simply endurance and nerves not to make a mistake, not to begin combat actions prematurely and not give the enemy an extra chance for success. Elaboration of operational-strategic missions was accomplished successfully. The expertise in command and control at all levels also rose. In short, our art of military leadership demonstrated both an imaginative character and superiority over the military expertise of the fascist command.

During the Battle of Kursk the Soviet Armed Forces dealt the enemy a defeat from which fascist Germany no longer was able to recover. Thirty of its divisions were routed, including seven panzer divisions. German ground forces lost some 500,000 persons, 1,500 tanks, 3,000 guns and over 3,700 aircraft.<sup>6</sup> These losses and failure of the offensive widely publicized by Nazi propaganda forced the Hitlerites to assume a strategic defense once and for all across the entire Soviet-German Front.

General Guderian, Inspector-General of Germany's Armored Troops, had to admit: "We suffered a decisive defeat as a result of the failure of the 'Citadel' offensive. . . . The initiative went over completely to the enemy."<sup>7</sup>

The counteroffensive of Soviet forces at Kursk marked the beginning of the Red Army's general offensive, which lasted with short pauses until the very end of the war. During the fighting Soviet military leaders successfully mastered the art of controlling armies and fronts. The Supreme High Command Headquarters was becoming more and more confident in exercising strategic leadership of operations in a theater of military operations enormous in scope and was reacting to changes in the operations more and more efficiently by skillfully adjusting the actions of fronts.

A fundamental turning point in the course of the Great Patriotic War and of all World War II concluded as a result of the victory in the Orel-Kursk Bulge and the move of Soviet troops to the Dnepr.

The growth in the country's military-economic capacities allowed the Soviet command element to accomplish an offensive in the second period of the war by the successive conduct of two or three strategic operations. In 1944 the Red Army already was conducting strategic operations both successively and simultaneously on several axes. These were military actions which were well planned and skillfully conducted. First to move into the offensive were the Leningrad and Kalinin fronts, which carried out the Leningrad-Novgorod Operation, which lifted the blockade of Leningrad once and for all in January 1944. As a result of the Korsun'-Shevchenkovskiy, Crimean and Jassy-Kishinev operations the Red Army moved up to our state border with Romania and shifted combat actions to the territory of the ally of Hitler Germany.

The plans of the Supreme High Command were successfully implemented thanks to the exceptional courage, endurance and moral steadfastness of Soviet soldiers. The grandiose offensive unfolded under very difficult weather conditions. It was difficult to imagine such mud and such lack of roads as in the winter and spring of 1944. Even tractors and prime movers skidded. Artillerymen dragged the guns by themselves. With the help of the local populace, fighting men carried shells and cartridges by hand from position to position for dozens of kilometers. But the Red Army units burst forward irresistibly. For example, the rates of advance of the 2d Ukrainian Front were among the highest for the entire war.

The summer Belorussian Operation designated "Bagration" was the most grandiose in strategic and military-political significance for the further course of World War II. The unprecedented scope as well as the number of front operations carried out simultaneously and successively in a seemingly independent manner but at the same time in a closely interconnected way indicate that the Soviet command firmly mastered the art of organizing and conducting the strategic offensive.

The success of a majority of the Red Army's major operations depended largely on proper organization and tying together of front actions. The Belorussian Operation is brilliant confirmation of this. All five fronts participating in it acted cohesively in carrying out the missions assigned them. And after

eliminating the gigantic pockets near Vitebsk and Minsk, the Supreme High Command Headquarters ordered the fronts to pursue the enemy immediately and widen the breakthrough even more. Now the fronts were to deliver strikes along divergent axes, unfolding a unique "strategic sheaf."

As a result of the summer operations of 1944 Soviet troops moved to the Carpathians, to the Vistula and to the border of East Prussia. East Prussia long ago had been turned into a supreme strategic base of operations by Germany for an attack on Russia and Poland. The attack on Russia in 1914 was made from this base of operations. The Kaiser's troops tried to deliver an attack on Petrograd in 1918 from here. The fascist hordes moved from here in 1941.

During the war East Prussia had an important economic, political and strategic significance for the German High Command. Hitler's headquarters, nicknamed Wolfsschanze ("Wolf's Lair") by the fascists themselves, was located here in deep underground shelters near Rastenburg right up until 1944. The taking of East Prussia--citadel of German militarism--comprised an important page in the final phase of the war in Europe. According to plans of the fascist command, Prussia was supposed to firmly screen approaches to Germany's central regions. Long before the Soviet troops moved to the borders of this region the Hitlerites began to erect a system of strong defensive works there. By 1945 the East Prussian fortified areas and defense zones with fortresses combined with natural obstacles included in them conceded nothing in might to the West German "Siegfried Line" and surpassed it in some sectors. The fascist command counted on halting the advance by our forces here no matter what.

The East Prussian operation began on 13 January 1945. Our troops surpassed the enemy 2.1 times in personnel, 3.1 times in artillery, 5.5 times in tanks and 4 times in aircraft.<sup>8</sup> It was the first time the Red Army had had to penetrate such a strong enemy defense. The fighting was extremely fierce. This operation had no equal in the history of war in expenditure of ammunition. Both of our fronts (the 3d and 2d Belorussian) expended over 15,000 carloads of ammunition.<sup>9</sup>

The Hitlerites resisted with unprecedented determination but, displaying astounding steadfastness, fearlessness and mass heroism, the Soviet soldiers advanced irresistibly. After four days of heavy fighting troops of 3d Belorussian Front completely took the capital of East Prussia, Koenigsberg, on 9 April.

General Lasch, the commandant of Koenigsberg, said in an interrogation in the front headquarters: "During the first two days the officers and men of the fortress held out steadfastly, but the Russians surpassed us in forces and got the upper hand. They were able to concentrate secretly such numbers of artillery and aircraft, the massive employment of which demolished fortress fortifications and demoralized the officers and men. We completely lost command and control. . . . It was impossible to presume that a fortress such as Koenigsberg would fall so quickly. The Russian command developed this operation well and executed it superbly. We lost an entire 100,000-man army at Koenigsberg. The loss of Koenigsberg is the loss of the fortress and the German bulwark in the east."<sup>10</sup>

Hitler was not able to reconcile himself with loss of the city, which he had declared the best German fortress in all of Germany's history and "an absolutely impregnable bastion of German spirit," and in impotent fury he sentenced Lasch to capital punishment in his absence.

The East Prussian operation, conducted under exceptionally difficult conditions, was one of the indicators of the enormous combat might of the Soviet Armed Forces and the maturity of military art. It enriched the Red Army with new experience in fighting a strong enemy who was relying on a defense prepared excellently and deeply developed in the engineering and weapons sense on terrain extremely favorable for it. Soviet troops had to accomplish the mission of eliminating the enemy over a large area by pressing him to the Baltic Sea. This forced us to resort basically to frontal attacks and as a rule deprived us of an opportunity to conduct actions only for encirclement. Powerful artillery and strong bomber aviation played a leading part in the operation. The experience of their employment in coordination with attacking troops is interesting and instructive.

The gun tubes had not yet had time to cool in East Prussia when the largest concluding battle of World War II--the Berlin Operation--began.

A fascist German grouping numbering some one million officers and men was routed in the Berlin Operation. The capital of Hitler's Reich fell and the document on Germany's unconditional surrender was signed on 9 May 1945.

A number of features distinguishes the Berlin Operation. Above all it is the brief time of preparations--just two weeks. The Stalingrad, Belorussian, Jassy-Kishinev and Vistula-Oder operations were prepared for at least one or two months. The rates at which concluding battles were carried out indicate that the Soviet war economy and the Armed Forces had reached a level by 1945 which permitted them to do what previously seemed a miracle.

A second feature of this operation is the originality of the strategic concept very typical of the concluding stage of the war. Troops of three fronts--the 2d Belorussian (Mar SU K. K. Rokossovskiy), 1st Belorussian (Mar SU G. K. Zhukov) and 1st Ukrainian (Mar SU I. S. Konev) simultaneously delivered six attacks across a 300-km front. The Hitlerite armies were pinned down along the entire Oder-Neisse defensive line. At the beginning of the operation German troops were not enveloped from all sides but the encirclement maneuver was completed as a result of the brilliant breakthrough of our tank armies. This was a new step in development of military art.

Almost all achievements of Soviet military science were embodied in the Berlin Operation.

The strategic and operational breakthrough of an enemy defense always is a difficult problem. Many military leaders, especially in World War I, were not able to carry out their plans because the attack by their armies bogged down in the enemy defenses. But thanks to precise coordination among armies and fronts and among combat arms and thanks to surprise in delivering attacks and continuity in developing the offensive by committing tank and mechanized combined units to the breakthrough, Soviet forces attacked across a broad front,

especially in the final period of the war, and crushed carefully prepared enemy defensive positions. That was the case in East Prussia and that was the case in the attack on Berlin.

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During the war years Soviet military science covered a long path. In their work the Soviet military leaders always followed the spirit of party resolutions, steadily developed the principles of military art, found in every operation a new solution most fully meeting the concrete strategic and political situation, and tried to make effective use of the indisputable advantages of socialism in opposition to the enemy. Imaginative style, innovativeness, swiftness of adopting the latest achievements, a deep party spirit and a class direction--these are the primary traits of Soviet military science thanks to which it was transformed into the most advanced science in the world.

The history of the Great Patriotic War demonstrated convincingly the role played by Soviet military thought, its imaginative development and expert application in achieving victory.

In mentioning the successes of Soviet military art I would like to reemphasize that realization of the strategic plans of the Supreme High Command Headquarters would have been impossible without the steadfastness and courage of fighting men and commanders of the glorious Red Army, without the valor and heroism they displayed on the battlefield, and without their discipline, ability to endure any hardships and inexhaustible faith in our victory. And in noting the moral state, combat readiness and combat effectiveness of Soviet troops, one has to say the kindest words about political workers concerned by literally everything in the war: Had the fighting men understood their combat missions correctly? In what condition were their weapons and combat equipment? How were they fed, trained and dressed and how would they be supported during combat? Would they succeed in resting or reading a newspaper? The political worker was obligated to concern himself with all this. And if our troops did not lose faith in victory and preserve high moral-combat qualities throughout the war and even in the moments most difficult for them, great credit here goes to the party and Komsomol workers.

The Soviet people's world-historic victory over fascist Germany and militarist Japan in the Great Patriotic War was a victory of the Soviet socialist social and state system created by October. Public ownership of the means of production and a planned system of economy permitted realigning the economy to a wartime footing in the shortest possible time and directing all forces and means to defeat the enemy. The social-political and ideological solidarity of Soviet society and the friendship of USSR nations was the basis for the unity of the front and rear and gave the Soviet state and its Army incalculable forces.

The victory over the fascist bloc was a victory of the whole Soviet nation. Having supplied the Army with first-rate combat equipment, ammunition, gear, fuel and rations and giving the soldiers powerful moral support hourly, toilers of the rear thus ensured the historic success of the struggle against fascism.

The Communist Party confidently led the nation and its Army to victory through the ordeals and hardships of war. It was unwaveringly united and combat effective. The nation completely trusted and supported it. CPSU CC General Secretary L. I. Brezhnev said the following of the unity of party and nation at the 25th CPSU Congress: "Soviet citizens know that where there are difficulties, the party members are in the front. Soviet citizens know that party members will not let us down no matter what happens. Soviet citizens know that where the party is, there is success and there is victory!"<sup>11</sup>

The Communist Party lifted up Soviet citizens for a sacred struggle in defense of the achievements of the Great October and was able to subordinate all the country's material and nonmaterial forces to the interests of armed struggle and ensure a unity of political and military leadership. As noted in the CPSU CC Theses "On the Centennial of Vladimir Il'ich Lenin's Birth," the Soviet nation achieved an outstanding victory over a crafty enemy because "socialism ensured the indestructible unity of all Soviet society, the might and unprecedented mobility of its economy, and the high development of military science; and brought up remarkable soldiers and military leaders."<sup>12</sup>

Party work, titanic in scope and depth, associated all forces of the Soviet nation in the drive toward one goal--total defeat of the enemy. And this great goal was achieved successfully.

The Soviet nation has not forgotten and over the centuries will not forget the terrible events of the war or the bright names and images of the fallen heroes. They have been immortalized in the living hearts of generations. All honest people of the Earth, those who experienced the hardships of war, who remember it or who know the high cost with which victory was achieved, understand that peace and friendship among nations and the freedom and happiness of working mankind will be their best monument to heroes of the bloody struggle against fascism.

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## ARMED FORCES

### TABLE OF CONTENTS OF 'KOMMUNIST VOORUZHENNYKH SIL', NO 12, JUNE 1982

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 12, Jun 82 (signed to press 3 Jun 82) pp 1-2

[Full-text translated articles published in this report are indicated with an asterisk (\*)]

[Text]

CONTENTS	Page
The USSR Food Program in the Period to 1990 and the Measures of Its Implementation (Proceedings of the May 1982 Plenum of the CPSU Central Committee)** . . . . .	
The 19th Congress of the All-Union Lenin Young Communist League . . . . .	3
Concern for the Interests of the People--A Matter of Honor for the Komsomol. Speech by Comrade L. I. Brezhnev at the 19th Komsomol Congress . . . . .	5
*Lead Article: Recommendations of the All-Army Conference of Primary Party Organization Secretaries--to Life! . . . . .	11
USSR--60 YEARS	
The Triumph of Lenin's Nationalities Policy--V. Ruben . . . . .	18
The Exhibition of the Achievements of the USSR National Economy in the Jubilee Year . . . . .	27
Illuminated by the Sun of October . . . . .	32
Initiative, Creativity--the Key to Success--V. Pindich . . . . .	36
OUR CALENDAR	
An Outstanding Revolutionary Leninist (On the 100th Anniversary of Georgiy Dimitrov's Date of Birth)--I. Shinkarev . . . . .	41

\*\*Published as a separate pamphlet and sent to subscribers.

PROBLEMS OF TRAINING AND MILITARY INDOCTRINATION

*To Fly Reliably, to Fly Without Accidents--L. Batekhin . . . . .	47
The Sources of Stable Successes--A. Nikanov . . . . .	55

IDEOLOGICAL WORK--HIGH QUALITY AND EFFECTIVENESS

The Authority of the Propagandist--I. Kolomiyets . . . . .	60
--	----

KOMSOMOL LIFE

Trust--V. Voloshin . . . . .	65
------------------------------	----

FOR POLITICAL LESSON GROUP LEADERS

*V. I. Lenin--Founder of the Soviet State and Its Armed Forces-- A. Skryl'nik . . . . .	70
--	----

AMONG OUR FRIENDS

Following a Course of Creation (On the Third Five-Year Plan of Socialist Vietnam)--A. Nikul'chenkov . . . . .	78
--	----

ON INTERNATIONAL TOPICS

*The Indian Ocean: Intrigues of Imperialism and Reaction--Yu. Sedov . .	84
---	----

CRITICISM AND BIBLIOGRAPHY

*New Training Aid on Scientific Communism--V. Khalipov . . . . .	90
Book Briefs . . . . .	92

IN THE DISTRICTS AND FLEETS

Studying Decisions of the May Plenum of the CPSU Central Committee; Unified Political Days, Sociopolitical Readings; In the Fight for Military Order; In Cooperation With Scientists; In the Red Banner Far East Military District; Raising the Quality of Political Lessons; A Person Behind Every Letter . . . . .	94
--	----

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CSO: 1801/300

## ARMED FORCES

### STRESS ON IMPLEMENTING ARMED FORCES PARTY CONFERENCE RECOMMENDATIONS

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 12, Jun 82 (signed to press 3 Jun 82) pp 11-17

[Article: "Lead Article: Recommendations of the All-Army Conference of Primary Party Organization Secretaries--to Life!"]

[Text] Convened in May by decision of the CPSU Central Committee, the Sixth All-Army Conference of Primary Party Organization Secretaries became an important event in the life of the Soviet Armed Forces. It discussed the pressing problems of party-political work and planned the ways of further improvement of the initiative, aggressiveness and adherence to principles manifested in the activities of party organizations aimed at mobilizing all personnel for successful completion of the tasks posed by the 26th CPSU Congress to the armed forces.

The conference participants, all communists and all personnel of the army and navy were highly inspired by the greetings from the party Central Committee, signed by CPSU Central Committee General Secretary Comrade L. I. Brezhnev, perceiving them to be a battle program of their subsequent activities. The greetings of the CPSU Central Committee, as is true of the convocation of the conference of primary party organization secretaries itself, is a new expression of the unweakening attention of the Communist Party and its Central Committee to our armed forces. The party is constantly concerned for raising the combat readiness of the army and navy and for improving party-political work and the activities of political organs and party organizations in the service. All of their life is proceeding under the influence of the decisions of the 26th CPSU Congress. The attention of army and navy communists should be focused, state the greetings of the CPSU Central Committee, on constant improvement of party-political work, reinforcement of ties with the broad masses of servicemen, their indoctrination in the spirit of Soviet patriotism, proletarian internationalism and unlimited devotion to the socialist motherland, improvement of the quality of the combat and political training of the soldiers and promotion of high discipline and military order. Further growth in the aggressiveness, effectiveness, initiative and adherence to principles of party organizations in solving the problems of maintaining the high alertness and combat readiness of the Soviet Armed Forces is now acquiring special significance, emphasized the greetings.

As was noted in the concluding remarks at the conference by CPSU Central Committee Politburo member, USSR Minister of defense, Marshal of the Soviet Union D. F. Ustinov, the premises contained within this highly important party document predetermined the basic directions of the activities of party organizations and all communists aimed at improving the combat readiness of the armed forces. It is in these directions that the party organizations must concentrate their efforts.

The concrete ways of implementing party requirements and improving the activities of party organizations were defined at the conference in reports given by USSR minister of defense, Marshal of the Soviet Union D. F. Ustinov and chief of the Main Political Directorate of the Soviet Army and Navy, Army General A. A. Yepishev. It was noted that a significant amount of experience in party work concerned with solving the problems of combat readiness and ensuring high quality in field, aerial and naval skills was accumulated in the course of fulfilling the directives of the 26th CPSU Congress. The unique features of the military-political situation and the specific characteristics of service in the units and aboard ships are now being accounted for more fully in party work, and party influence upon the actions taken by troops and naval forces in a situation close to that of real combat has intensified.

The socialist competition for an honorable welcome to the 60th anniversary of the USSR under the slogan "Dependable Protection for the Peaceful Labor of the Soviet People!" has achieved broad scope in the military collectives. Increasingly greater support can be observed in the initiatives of the missile units--"From a master in the crew to a crew of masters," in the ground troops--"Outstanding results in each day of training," in the air defense forces--"No one falls behind," in the air force--"Excellent knowledge and maintenance of equipment and weapons," in the navy--"Fight for the right to be called successors of the best specialists of the war years" and in the military construction units and railroad troops--"Sixty shock weeks for the 60th anniversary of the USSR." The educational role of competition is rising. More concern is now being displayed toward the personal example of communists. The absolute majority of the party members and candidates are marching in the first ranks of the competitors.

The conference generalized the work experience of party organizations associated with completing the missions of combat duty, improving field skills and special tactical training, assimilating complex combat equipment, and the moral-political training and psychological tempering of the personnel. Mention was made of the purposefulness and efficiency of party work conducted by political organs and party organizations in the course of exercise "Zapad-81." The best experience deserves broad dissemination.

The conference showed that a desire to delve deeply into all aspects of the life and activities of the troops and naval forces, to influence fulfillment of the tasks of combat readiness and the training of units and ships more concretely, to constantly seek the most effective methods of organizational and political work in the soldier masses and of publicizing the best experience, and to take steps to eliminate shortcomings in combat training has now become typical of most party organizations. In particular, mention was made of the aggressiveness of the party organizations of the motorized rifle regiment in

the Moscow Military District commanded by Major S. Sergeyev, of the missile unit in which Senior Lieutenant S. Bukan' is the party bureau secretary, of the ship aboard which Captain-Lieutenant B. Nagornyy is in charge of the party collective and of a number of other units and ships.

Owing to the daily attention of the party and government and the active work of military councils, commanders, political organs and party and Komsomol organizations, our armed forces have made a new step forward in their development and combat improvement. Many units have achieved high indicators in combat and political training and in the fight to strengthen military discipline.

However, as was noted in the reports and speeches, it would be incorrect to overstate the accomplishments. The arsenal of resources available to party organizations for influencing fulfillment of the tasks of combat readiness and combat training is still not being utilized fully. Not all party organizations have been able to adequately reorganize their work in light of the requirements of the 26th CPSU Congress, or satisfy its directives concerned with raising the aggressiveness and initiative of party organizations and ensuring their adherence to principles. Attention was turned to the need for more decisively eradicating the gap in party practice between word and deed, speechifying and red tape, and for more actively encouraging all communists to participate in the solution of practical problems.

It was also noted that some party committees and bureaus sometimes have a poor knowledge of the true state of affairs in the subunits, that they do not adhere to principles or display intolerance in relation to laxity in the organization of training, and that they are not demanding enough of party members and candidates in relation to their personal combat skills and the combat readiness of the subunits, units and ships entrusted to them.

The requirements on combat readiness and combat training are growing. The reason for this lies in the tense military situation, in the complexity of the equipment and armament which servicemen are called upon to assimilate in short time, and in the qualitative changes occurring in the personnel. Fulfillment of the recommendations of Comrade L. I. Brezhnev to the party organizations, as stated at the 26th CPSU Congress--more initiative and greater adherence to principles--was analyzed at the conference in this connection.

The aggressiveness of party organizations in the army and navy, it was stated at the conference, should be manifested mainly in consistent implementation of party policy in the armed forces, in the ability to knowledgeably delve deeply into all aspects of the life and activities of the subunits, units and ships and effectively influence them, and in persistent encouragement of communists to play the leading role in the military collectives. Initiative and aggressiveness imply timely consideration and persistent solution of the pressing problems of training and indoctrination of the personnel, reinforcement of military discipline and maintenance of high combat readiness.

In light of the recommendations spelled out in the reports, speeches and the resolution of the conference, every elected party organ and party organization

secretary must maintain a deep knowledge of the state of affairs in the most important areas of combat readiness and training of the personnel, reveal and strictly evaluate shortcomings and take steps to correct them. Party organizations must raise their exactingness toward the instructor training afforded to communist officers and to their mastery of the methods of teaching the troops, art of war and the best experience, and they must deal more concretely with the problems of assimilating new equipment and armament, raising the technical preparedness of the leading specialists, improving military-technical propaganda and developing efficiency and invention work.

The dynamic life of the troops and fleets urgently requires party organizations to fight actively to upgrade the quality of every lesson in combat and political training, for unconditional fulfillment of training plans and programs, for effective utilization of training time and the possibilities of the material base and for ensuring a high methodological level in the training process. This means that the party organizations must constantly and persistently nurture, in all communists, a creative approach to their work and initiative and efficiency in their work, and they must wage a more decisive struggle against manifestations of indifference and a lack of strictness in evaluating achieved results. The party committees and party bureaus are obligated to constantly and deeply analyze and strictly evaluate fulfillment of each communist's party and official duty and his personal contribution to the success of the unit and ship, and they must be more demanding of party members and candidates not only in relation to their own indicators but also the results of the combat readiness and training of their subunits. The lagging subunits need special attention.

Socialist competition is an important means of mobilizing the masses for fulfillment of the tasks of combat and political training. It has enjoyed extensive development in the troops and fleets. However, as was noted at the conference, there is still a great deal of formalism in its organization, there is too much emphasis on outward appearance, and concern is not always shown for maintaining a spirit of rivalry in every lesson and for rendering mutual assistance. The desire and readiness to share experience are occasionally inadequate. Sometimes high exactingness is not displayed toward communists failing their socialist pledges.

This is why we must take steps to ensure higher effectiveness of the competition in every unit and aboard every ship, and why we must develop it more actively in terms of concrete tasks and standards between specialists, crews, squads, subunits, units and ships, and support the movement for best formation. The conference called upon communists to study the experience of the best units more deeply and to persistently introduce it into the practice of all military collectives. The party organizations must do everything they can to see that the socialist competition for an honorable welcome to the 60th anniversary of the USSR's formation would actively promote further improvement of the combat readiness of the Soviet Armed Forces.

One of the most important areas of our work, in which the influence of party organizations on successful completion of the tasks of combat readiness is actively manifested, is that of strengthening military discipline. A decisive role belongs in this area to the unit commanders--one-man commanders bearing full responsibility for combat and political training, indoctrination, military discipline and the political-moral state of the personnel. Party organizations

are a dependable support to commanders in this effort. Wherever their actions are harmonious and coordinated, wherever active, purposeful organizational and political indoctrination work is conducted in satisfaction of the requirements of the CPSU Central Committee, Soviet laws, military regulations and the orders of chiefs, and wherever a persistent effort is made to see that every communist observes the high principles of the moral code of a builder of communism and encourages his fellow servicemen to do the same, there firm order, discipline and organization are maintained. Many examples of active work by commanders and political organizations in this area were presented at the conference. It was pointed out that many units and ships are living without incident, that they are distinguishing themselves by high organization and military order, and that this is helping them to successfully complete their combat training missions.

The significance of discipline has grown even more at the present stage of the army's and navy's development. Without firm discipline, said the USSR minister of defense in his report, there can be no combat readiness. Improvement of party-political work aimed at strengthening discipline is dictated by life itself. This is why the conference condemned the shortcomings and omissions in the effort to maintain discipline and order. It emphasized that the effectiveness of the efforts of a number of party organizations is still low in matters of discipline. In light of the growing requirements on the armed forces, the conference appealed to party organizations and all communists to concentrate their attention on strengthening discipline as one of the priority tasks. Every party organization must display concern for ensuring an integrated approach to strengthening military order, to achieving better unification of organizational and educational measures in this effort and for raising the personal contribution made to discipline by all party members and candidates. The communists, states the resolution of the conference, is obligated not only to fulfill the requirements of the manuals, orders and instructions in exemplary fashion himself, and to be an example in the observance of the norms of communist morality, but he must also utilize his personal influence to support discipline and a healthy moral atmosphere in the military collective of the subunit, unit or ship.

Party organizations are called upon to constantly reinforce one-man command, to actively support exacting, willful commanders and chiefs and to help political officers--especially young commanders and political workers--to maintain military order and indoctrinate subordinates. In this connection the party organizations of military training institutions should delve more deeply into the methods used to prepare students and cadets for independent work in the units and aboard ships, and teach them the art of indoctrinating people.

It is also important to raise the responsibility of party committees, party bureaus and party organization secretaries for the quality and effectiveness of political, military, moral and legal indoctrination of the servicemen, and to encourage them to work individually with the servicemen and create a healthy moral climate in the military collectives. Every communist must explain the provisions of the USSR Constitution, Soviet laws, the military oath, the manuals and orders to the personnel and fight for their unconditional fulfillment. The patriotic and international indoctrination of the people must be

improved, and more concern should be shown for unifying the multinational military collective.

In compliance with the conference resolution, party organizations must react efficiently to cases of inefficiency and of cover-ups of violations, and they must condemn more strictly the behavior of those communists who relate passively to their duties, permit abuses of service position and violate the norms of communist morality. We must persistently comply with Comrade L. I. Brezhnev's directive at the 26th CPSU Congress that "our relationship to those who behave unworthily and who violate the party Charter and the norms of party morality has been, is and will be one of intolerance. There can be no concessions to anyone when the discussion turns to the honor and authority of our party and the purity of its ranks!"

The interests of reinforcing discipline require that every party executive achieves closer ties with the soldiers, becomes aware of their moods, demands and needs, displays intolerance toward all cases of indifference toward people and promotes elimination of shortcomings in their material and personal support and in cultural services.

It was noted at the all-army conference that the content of ideological work is being actively enriched in the party organizations under the influence of the decisions of the 26th CPSU Congress and the well known decree published by the Central Committee on 26 April 1979. The party organizations are displaying daily concern for the ideological maturity of communists and for shaping communist conviction, faithfulness to military duty and a readiness to defend the motherland in the personnel. They are doing much to raise the scientific level and aggressiveness of propaganda and agitation, and to reinforce its ties with life and with the concrete missions of the troops. It was noted at the same time that the party organizations possess significant unutilized reserves in the area of ideological work. Thus some do not yet display adequate attention to encouraging each communist to take an active part in this work. In some party organizations the problems and status of propaganda and agitation are rarely analyzed, the analysis is not always very deep, and the effectiveness of particular political indoctrination measures is weak. This is why it is the important duty of every party organization to energetically implement the party's requirement of constantly improving ideological work and raising its effectiveness. Formation of a scientific philosophy in Soviet soldiers and their indoctrination in the spirit of selfless devotion to the cause of the party and to communist ideals have been and continue to be the core of this work.

Life persistently requires that we competently conduct comprehensible and well grounded propaganda of the decisions of the 26th CPSU Congress and the historic advantages and achievements of real socialism, and that we indoctrinate soldiers in the spirit of Soviet patriotism, proletarian internationalism, inviolable friendship of the peoples of the USSR and combat cooperation with armies of fraternal countries. The ideological indoctrination efforts of every party organization must promote full development and reinforcement of revolutionary alertness of the Soviet soldiers and their class self-consciousness, and it must instill hatred of the enemies of socialism and a readiness to fulfill one's patriotic and international duty with merit and honor.



The conference noted the need for working more aggressively and persistently to make each party organization and party group the center of daily ideological indoctrination and an active unifying force of military collectives. This obligates party organizations to display constant concern for making every party member and candidate an active political warrior of the party, to help them study Marxist-Leninist theory, to more actively encourage communists, especially executives, to indoctrinate the personnel, and to teach propagandists the methods of their trade. An effort must be made to see that indoctrination in the subunits is concrete, interesting and persuasive, and that it effectively mobilizes the personnel to solve the problems facing the units and ships.

The all-army conference emphasized that the party organizations of the army and navy have grown stronger in organizational respects in recent years, that they are living a fruitful, creative life and that they have been enriched with new experience in party organizational work. The conference appealed for further improvement of internal party life in light of the directives of the 26th CPSU Congress, to persistently elevate the role of every party organization as the political nucleus of the military collective and to develop the initiative and responsibility of communists for implementing party policy, unifying and raising the combat readiness of the party ranks and complying unconditionally with the CPSU Program and Charter.

It is important for the party committees and bureaus to continue to devote constant attention to consistent compliance with Lenin's principles of party membership, to raise exactingness toward selection of CPSU candidates, to elevate the significance of candidacy and to improve indoctrination of young communists. Improvements must be made in the leadership afforded to the subunits by party organizations, the effectiveness of party, party committee and party bureau meetings must be raised even higher, all party members and candidates must be encouraged to take an active part in party life, and intolerance of shortcomings must be affirmed in all party organizations. The party organizations are called upon to strictly condemn all violations of the rules of party life and communist morality, and attempts to suppress and ignore criticism. Improvements must be made in surveillance over execution of party decisions and implementation of the proposals of communists and nonmembers. The party committees and party bureaus must influence the selection, placement and indoctrination of personnel more actively, display adherence of principles in evaluating the working and political qualities of party members and candidates, and they should make broader use of the practice of making communists give reports on their activities and of individual discussions with them for this purpose. The activeness of party commissions in checking fulfillment of the CPSU Charter by communists and compliance with party and military discipline must be developed as well.

Party leadership of Komsomol and trade union organizations is one of the most important directions in the activity of party organizations promoting their daily influence upon combat training tasks. The work of communists in elected Komsomol and trade union organs is a responsible assignment from the party. Party organizations must see that every Komsomol organization structures its daily life with regard to requirements of the 26th CPSU Congress, the decisions of the 19th Komsomol Congress, the changes that have occurred in the

qualitative composition of young army and navy soldiers and their greater interests, and they must constantly strive to make Komsomol members play a leading role in service, study and discipline.

In light of the directives stated by Comrade L. I. Brezhnev at the 17th Trade Union Congress, we need to constantly improve party leadership of trade union organizations and actively direct their effort at developing the labor and political activity of laborers and white collar workers and at fulfillment and overfulfillment of the quotas of 1982 and the 11th Five-Year Plan as a whole. The party organizations of khozraschet enterprises and construction projects must persistently master the methods of party surveillance over the activity of the administration, and make fuller use of commissions created for this purpose and of the work of people's control organs and other public organizations.

It was emphasized at the all-army conference that further development of initiative, aggressiveness and adherence to principles in the work of the party organizations would be unimaginable without improvements in the leadership provided to them by political organs. The latter are called upon to raise the level of their organizational activity in party organizations, display more attention to the proposals of communists, help them more actively to solve pressing problems and make fuller use of the possibilities of examining their inspection results at party meetings and at meetings of the party committees and party bureaus. At the same time it is important to take fuller consideration of the specific features of the work being done by party organizations of both the units and ships on one hand and the control organs, military commissariats, other institutions, construction organizations and production enterprises on the other.

Political organs should strive for the closest possible interaction of all party units, and they must teach the art of lively, creative work with people and the ability to direct the activities of party organizations to commanders and political workers more concretely. The conference turned attention to further improvement of the efforts to teach active party members the work methods typical of party organizations. Political organs must make fuller use of general party experience and the experience of the party organizations of the leading units and ships for this purpose.

Organizational and political work has assumed broad scope in the army and navy in connection with the results of the All-Army Conference of Primary Party Organization Secretaries. Practical measures aimed at implementing the directives of the conference are being discussed at meetings of formation party members, in the primary party organizations and at meetings and conferences of the command and political staff, and they are being explained to all communists.

It is the task of commanders, political organs and every party organization to consistently and persistently implement the directives contained in the greetings of the CPSU Central Committee to the conference participants, the premises and conclusions contained in the report given by the USSR minister of

defense and the chief of the Main Political Directorate of the Soviet Army and Navy, and the recommendations of the all-army conference. It is also important to continue to constantly and persistently raise aggressiveness, initiative and adherence to principles in the work of party organizations, to untiringly fulfill the directives of the 26th CPSU Congress associated with raising the combat readiness of the armed forces, and to meet the 60th anniversary of the USSR's formation with honor.

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## ARMED FORCES

### OUTLINE FOR INDOCTRINATION ON LENIN, ARMED FORCES

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 12, Jun 82 (signed to press 3 Jun 82) pp 70-77

[Article by Maj Gen A. Skryl'nik, candidate of philosophical sciences: "V. I. Lenin--Founder of the Soviet State and Its Armed Forces"]

[Text] Study of this subject will help students recognize even more deeply the outstanding role played by Vladimir Il'ich Lenin as the organizer and inspiration of the victory of the Great October Socialist Revolution and as creator of history's first workers' and peasants' state and its armed forces. During this lesson it is important to give the students an interesting and comprehensible explanation of Lenin's premises on the nature and historical purpose of the new, socialist type of army, to demonstrate how Lenin's ideas on development of the Soviet state and its armed forces have been embodied in the USSR Constitution and to reveal the nature of the constitutional duty of a defender of the socialist fatherland.

Out of 10 hours devoted to the study of this subject, it would be suitable to allocate 2 hours for lecture (narration), 4 for independent work and 4 for a seminar (discussion).

Illumination of the following issues is recommended in the lecture (narration):

1. V. I. Lenin--the leader of Great October.
2. V. I. Lenin--founder of the world's first socialist state and organizer of the Soviet Armed Forces and of the country's defense in the civil war.
3. The USSR Constitution--the embodiment of Lenin's ideas on development of a socialist all-people's state and its armed forces.

It should be emphasized in the introductory remarks that the most outstanding event of the 20th century--the Great October Socialist Revolution, creation, formation and development of the world's first socialist state, and the birth, combat history and improvement of the Soviet Armed Forces are all associated with the name of V. I. Lenin. The genius of Vladimir Il'ich--an outstanding theorist and practitioner of revolutionary thought and action--is obviously expressed in all things which characterize the life of our people today, the high social activity of the masses, the labor rhythm of the 11th Five-Year Plan, the flourishing of the spiritual riches of all of the union republics and development of the world revolutionary process. "The scale of Lenin's thoughts and actions was so enormous, and he was able to understand and express the urgent needs of his era so deeply," indicated Comrade L. I. Brezhnev, "that Lenin's

ideas are still a powerful weapon in the hands of the champions of the happiness of peoples" ("Leninskim kursom" [Following Lenin's Course], Vol 2, p 551).

#### 1. V. I. Lenin--the Leader of Great October

Entering the world arena of the class struggle as a faithful and steadfast continuer of the great cause of Marx and Engels, Lenin developed their revolutionary teaching in its entirety. He creatively enriched all of the components of Marxism with fundamentally important premises in application to the new historic conditions. The revolutionary transforming role of the theory of scientific communism and its unity with the revolutionary practice of the party of the Bolsheviks, created by V. I. Lenin, were brilliantly expressed in the victory of the October revolution. The theory of the socialist revolution was developed by V. I. Lenin in the works "Two Tactics of Social Democracy in the Democratic Revolution," "Imperialism as the Highest Stage of Capitalism," "The Military Program of the Proletarian Revolution" and in a number of other works. In his "Letters From Afar" Vladimir Il'ich Lenin spelled out the tactics of the Bolsheviks in the struggle to transform the bourgeois-democratic revolution into a socialist one.

Following the victory of the bourgeois-democratic revolution in February 1917, V. I. Lenin, who was compelled to seek sanctuary abroad from the tsarist secret police for many long years, longed to return as quickly as possible to assume leadership over the revolutionary movement of the masses. V. I. Lenin's reception at the Finland Terminal in Petrograd, where he arrived on the night of 3 April 1917, turned into a grand manifestation of the revolutionary forces and of the growing authority of the party of the Bolsheviks. The city's proletariat and revolutionarily predisposed soldiers and seamen gave a tumultuous welcome to the leader's return to the motherland. At the platform, laborers and soldiers raised him to the top of the armored train. Vladimir Il'ich concluded his first speech to the masses following his return to Petrograd with an arousing slogan: "Long live the socialist revolution!"

On the following day V. I. Lenin addressed a meeting of Bolsheviks with the report "On the Tasks of the Proletariat in the Revolution." These were the famous April theses. They armed the party with a concrete program of action in behalf of the victory of the socialist revolution. "All power to the Soviets!"--such was their main motto. He urged the masses to annihilate the old and to create a new state administration wholly in keeping with the interests of the people. This was a time of discussion of a peaceful transfer of power into the hands of the working class and the impoverished peasantry. Taking this stance, V. I. Lenin never forgot for even a minute that power may have to be wrested from the bourgeoisie through an armed rebellion. This is why he persistently demanded creation of the revolutionary detachments of the Red Guard, and why he wanted the soldiers and seamen to be brought over wholly to the side of the Bolsheviks.

Armed with the April theses, our party initiated an enormous amount of work to mobilize the laboring masses for the socialist revolution. Together with his colleagues, V. I. Lenin often met with representatives of local party organizations, carefully briefed them and held discussions with laborers, soldiers and messengers from the peasants. Vladimir Il'ich devoted a significant

part of his time to PRAVDA. The newspaper published his articles almost every day. They deeply revealed the meaning of political events and the plans of the class enemy, and they indicated the path to victory over the exploiting classes--the path of the socialist revolution. Between the time of his return to Russia and July--that is, in 3 months--V. I. Lenin wrote over 170 articles, pamphlets, draft resolutions for Bolshevik conferences and for the party Central Committee, and appeals to laborers and soldiers.

Following the events of July, the counterrevolution openly attempted to strangle the Bolshevik party. The situation in the country changed fundamentally. The possibility for a peaceful transfer of power into the hands of the working class and the impoverished peasantry withered away. Therefore at their sixth congress the Bolsheviks assumed a course of armed rebellion. V. I. Lenin, who had gone underground during this complex period by decision of the Central Committee, sent his famous letters "The Bolsheviks Must Take Power" and "Marxism and Rebellion." The letters were sent out as a party directive for preparing for the rebellion.

Smolny, the home of the Petrograd Soviet, was the real headquarters of the rebellion. Revolutionary units and detachments of the Red Guard began drawing together here on 24 October. Late in the evening V. I. Lenin arrived at Smolny and assumed direct leadership of the armed rebellion. The revolutionary soldiers and seamen and the Red Guard acted boldly and decisively. They seized all government institutions, terminals, the post office, telephone and telegraph, and they encircled the Winter Palace. The rebellion proceeded extremely quickly.

At 1000 hours on the morning of 25 October the Military Revolutionary Committee published its historical appeal "To the Citizens of Russia!", written by V. I. Lenin. It stated: "The Provisionary Government has been deposed. State power has been transferred into the hands of an organ of the Petrograd Soviet of Workers' and Soldiers Deputies--the Military Revolutionary Committee, which stands at the head of the Petrograd proletariat and garrison.

"The cause for which the people have fought--immediate proposal of a democratic peace, repeal of private ownership of the land, workers' control of production and creation of a Soviet government--is assured" (Poln. sobr. soch." [Complete Collected Works], Vol 35, p 1).

Deprived of real power, the Provisionary Government sought shelter in the Winter Palace. V. I. Lenin gave orders to take the Winter Palace by storm. The attack began with a signal from the cruiser "Aurora." In the night of 26 October the Winter Palace fell. Thus 25 October (7 November 1917) entered history as the day of the victory of the Great October Socialist Revolution in Russia and as the greatest holiday of the peoples of our country and of all progressive mankind. The Country of the Soviets came into being for the first time in history. Creation of a new world began.

On the following day, 26 October, the Second Congress of the Soviets unanimously approve historic documents written by V. I. Lenin--the Decree on Peace and the Decree on Land. The congress formed the Soviet government--the Council of Peoples' Commissars, headed by V. I. Lenin.

Lenin's Decree on Peace proclaimed new principles of international relations and a policy of friendship and cooperation among nations. Soviet power raised the banner of the struggle for peace and against war for the first time over the land.

The Decree on Land announced confiscation of private land without compensation and the transfer of all land into the hands of the people. The land was nationalized--that is, it became state property. The peasants received more than 150 million hectares of land.

The Soviet government introduced the 8-hour work day at enterprises and established workers' control over production. The banks, railroads and merchant marine were handed over to the state. All major industry was nationalized. Foreign debts owed by the tsarist and Provisionary governments were canceled. This was, in Lenin's apt words, a Red Guard attack upon capital.

The Soviet government acquired command positions in the city and town. The foundations of a socialist national economy were laid. Laborers and working peasantry, progressive intelligentsia and all real patriots of Russia greeted the victory of the revolution.

## 2. V. I. Lenin--Founder of the World's First Socialist State and Organizer of the Soviet Armed Forces and of the Country's Defense in the Civil War

Immediately after the victory of October the Soviet government found itself facing enormous tasks. The victory of the revolution had to be secured, the resistance of overthrown classes of exploitation had to be crushed, and the old bourgeois state machinery had to be dismantled. A new socialist state had to be built.

V. I. Lenin became its founder. He embodied within himself the qualities of a state official of a new, proletarian, socialist type. For the first time in mankind's history the leader of a party of communists and of all the working class, a revolutionary Marxist who had a good knowledge of life and the laws of its development and who understood the innermost thoughts and aspirations of the popular masses, became the leader of a state.

In his speeches and appeals to the people, V. I. Lenin called upon the laborers to participate in state government, to unite about the soviets, to strengthen them and to display initiative and independence. "...socialism is a living, creative thing, it is the creation of the popular masses themselves," emphasized Vladimir Il'ich ("Poln. sobr. soch.," Vol 35, p 57).

The Marxist teaching on the dictatorship of the proletariat was a powerful weapon of the party in the struggle for creation of the socialist state. This teaching was developed in the works of V. I. Lenin "State and Revolution" and "The Impending Catastrophe and How to Fight It" and in a number of his other works. The leader of our party validated the premise that the workers' and peasants' state arising as a result of socialist revolution could only be a state of the dictatorship of the proletariat. This was a real democratic state, since it expressed the interests of the majority of the popular masses,

and since it was the main implement of the development of socialism. Its highest principle, emphasized V. I. Lenin, was that of maintaining a firm union of the working class with the peasantry and other strata of the laborers.

Vladimir Il'ich deeply revealed the essence of the soviets as a mass organization of those classes which had been oppressed by capital prior to the revolution. The soviets, he pointed out, were the permanent and sole foundation of our entire state machinery.

V. I. Lenin's fundamental conclusion that the Communist Party was the vanguard of the proletariat and the leading and guiding force in development of the socialist state has enormous theoretical and practical significance. Being the real expression of the interests of the laborers and their fighting political leader, it won undebatable authority among the masses, and the trust and respect of all the people.

History is indebted to V. I. Lenin for solving the most complex problems of development of the socialist state. His ideas were at the foundation of the first RSFSR Constitution, and of the formation of the Union of Soviet Socialist Republics.

The propagandist should turn the attention of the students to the first socialist transformations in the country, implemented on the initiative and under the guidance of V. I. Lenin. It would be important to emphasize that these transformations were history's first embodiment of the age-old longing of the working man for liberty and equality, that they offered him all of the possibilities and the right to become the real master of his country. But at the same time it should be pointed out that the October revolution raised the multimillion masses to conscious historical creativity, that it unbridled their energy and initiative and that it completely overturned the centuries-old prejudice that laborers are incapable of managing a state.

The new administrative machinery was created with the direct participation of laborers, soldiers and seamen under the guidance of party organizations. Thus the Peoples' Commissariat of Internal Affairs was formed with the assistance of laborers of the Putilovskiy Plant, while the Peoples' Commissariat for Foreign Affairs was created with the active participation of laborers of the "Simens-Shukert" Plant and seamen of the Baltic Fleet. The Peoples' Commissariat of Labor was manned by laborers and white collar workers of the metal-workers' trade union and the factory-plant committees. Red Guards and seamen were included in the organization of the Peoples' Commissariat of Food, and workers of the Petrograd and Moscow railroad terminals were included in the staff of the Peoples' Commissariat of Railways. The best workers of Vyborg formed the administration of the Peoples' Commissariat of Education.

The farther into the past the days in which the world first heard about the victory of the October Revolution fade, the deeper we recognized the unfading significance of Lenin's premise that no revolution is worth anything unless it can be defended. Following the victory of October, the counterrevolution undertook one attempt after another to wrest the power from the hands of the working class.



International capital, the bourgeoisie and the landowners initiated a civil war against the people who had seized control of the state. The accomplishments of October were courageously defended by Red Guard detachments. They were present in Petrograd, Moscow and many other industrial centers. The command of the Red Guard was elected, and strict discipline was maintained in the detachments.

Together with revolutionary soldiers and seamen the Red Guard detachments were the foundation of the military strength of the Soviet state in the first months of its history. They raided the Winter Palace, they seized the most important state institutions, and they repelled the onslaught of reaction.

Warriors and commanders of the Red Guard were distinguished by exceptionally high morale, class consciousness and an unshakeable will to defend the achievements of the revolution. Often inferior to the enemy in numbers, armament and military know-how, they emerged victorious over him. It was precisely in the Red Guard that the spiritual countenance of the soldier of a new, revolutionary army, of a steadfast and courageous defender of the socialist fatherland and of a real patriot and internationalist began to evolve.

But Red Guard detachments could not oppose the united forces of the internal counterrevolution and foreign interventionists for very long. V. I. Lenin and the Communist Party, evaluating the impending danger on a realistic basis, pointed out the sole correct path of organizing armed defense of the socialist fatherland to the people--creating an army of a new, socialist type. Lenin's words that our army is called upon to protect the accomplishments of the revolution, our popular rule, the soviets of soldiers', workers' and peasants' deputies and the entire new, truly democratic structure against all enemies resounded as a sacred order to Soviet soldiers.

Rising to the defense of the accomplishments of October, the revolutionary army and the party of Lenin openly declared their class nature. In a situation of counterrevolutionary forces inside the country, the workers' and peasants' state could not entrust weapons to anyone that came along. The proletarian government was compelled to select only representatives of the working class and the laboring peasantry for its ranks.

In our country a military organization was created for the first time in history not to seize foreign territories and enslave other peoples but to ensure the independence of the socialist state. The Decree on Creating the Red Army, which was edited by V. I. Lenin, clearly determined the historical purpose and class nature of the armed forces of the socialist state. It read: "The old army served as an implement of class oppression of the laborers by the bourgeoisie. With transition of power over to the laborers and the exploited classes, the need has arisen for creating a new army, one which would serve as the stronghold of Soviet rule...."

The leader of our party and people developed and scientifically grounded the idea of the decisive role played by socioeconomic and political factors in the organization, life and activities of the army of a proletarian state. He emphasized the dominant influence of party and Soviet development on military development, and on their organizational mutual relationship. Vladimir Il'ich

wrote later on that development of our army was successful only because it was created in the spirit of Soviet development in general (see "Poln. sobr. soch.," Vol 40, pp 76-77).

On 15 (28) January 1918 the Council of Peoples' Commissars adopted the Decree on Organizing the Workers' and Peasants' Red Army, and on 29 January (11 February) it adopted the Decree on Creating the Workers' and Peasants' Red Navy. The creation of military units and formations began throughout the entire country. This work was especially active after the hordes of the Kaiser's Germany, having violated the armistice, went over to the offensive along the entire front and placed Petrograd in jeopardy.

On 21 February 1918 the Soviet government turned to the people with a decree--appeal written by V. I. Lenin, "The Socialist Fatherland is in Danger!" Martial law was instituted in Petrograd, and the revolutionary troops and the Baltic Fleet were put on combat alert. Two days later the regiments and detachments of the young Red Army halted the advance of the German troops at the Narva and at Pskov by means of savage fighting. The day of 23 February entered the history of our motherland as the birthday of the Red Army.

The Eighth Congress of the Russian Communist Party (of Bolsheviks), which was held in March 1919, played an exceptional role in further formation of the Soviet Armed Forces. By its decisions it reinforced the fundamental principle of Soviet military development--the party's undivided leadership of the country's armed forces, and Lenin's principle of building a regular Red Army with strict discipline and centralized leadership.

One of the most important features of our army and navy was their inseparable ties with the laboring masses. The party has been untiringly concerned, and continues to be concerned, for constantly strengthening the sociopolitical and ideological foundations of this unity. The socialist army is not divorced from the people, and it does not stand in opposition to it as a bourgeois army does; instead, it is associated with the people in the most intimate fashion, and it is the defender of their interests.

The Soviet state ensured the right to participate in the defense of revolutionary achievements for all nations and nationalities of the country. The armed laborers and peasants and the revolutionary soldiers and seamen of all nationalities were called upon to defend the Soviet government, which liberated the peoples of Russia from social and national oppression. By the end of the civil war 77.6 percent of the soldiers in the army were Russians, 13.7 percent were Ukrainians, 4 percent were Belorussians, and 4.7 percent were Letts, Tatars, Bashkirs and soldiers of other nationalities.

Military specialists--former officers and generals of the old army--were actively recruited to build the Red Army on V. I. Lenin's instructions. Outstanding Soviet troop commanders and military chiefs grew out of their midst--A. I. Yegorov, B. M. Shaposhnikov, S. S. Kamenev, M. N. Tukhachevskiy, D. M. Karbyshev and many others.

V. I. Lenin was at the helm of all of the country's defenses and the combat activities of the Red Army in the civil war years. He headed the Council of

Workers' and Peasants' Defense, created 30 November 1918 to coordinate the activities of military and civilian departments and institutions in the center and locally, and to ensure unity of the front and rear. Between 1 December 1918 and 27 February 1920 the council sat more than 100 times. V. I. Lenin chaired all meetings except two.

S. S. Kamenev, commander in chief of the country's armed forces in 1919-1921, wrote: "Vladimir Il'ich provided direct and daily leadership to the Red Army.... From all of the numerous channels..., Vladimir Il'ich knew the real situation on the fronts, in the armies and in individual sectors of the fighting front. In thousands of cases Vladimir Il'ich knew more about the actual state of affairs than did the staff of the Republic Revolutionary Military Council."

K.A. Mekhonoshin, one of the military officials of that era, recalls that V. I. Lenin "was always able to provide the most valuable directives in time and to point out danger in one place or another in time. V. I. Lenin was the real commander in chief of all armed forces of the October revolution, and a 'Staff' which no military chief had ever possessed before worked under his guidance.... We can boldly call him our first Red marshal."

The basic issues of arming and supplying the army, placing military executives and developing the largest war operations of priority strategic significance were resolved in the party Central Committee under V. I. Lenin's direct guidance. Between November 1917 and November 1920 Vladimir Il'ich wrote more than 600 telegrams and letters pertaining to organization of the defeat of White Guard troops and interventionists. The basic strategic plans were developed and implemented with his direct participation. Fulfilling these plans, the Red Army destroyed the armies of the interventionists and the White generals to the man.

Various maps and diagrams reflecting the combat situation on the fronts of the civil war are stored as highly valuable historical relics in Lenin's office in the Kremlin. Most of the diagrams and maps have to do with combat activities against Kolchak and Denikin, the forces of whom presented the greatest danger to the cause of the revolution in 1919.

The officer corps of the young Red Army grew and matured under the guidance of V. I. Lenin and the party. Each day of savage struggle with White Guards and foreign interventionists ended with news of heroic acts by fronts, armies, divisions and brigades commanded by famous troop commanders M. V. Frunze, M. N. Tukhachevskiy, V. K. Blyukher, S. M. Budennyi, V. I. Chapayev, N. A. Shchors, G. I. Kotovskiy and many others.

Vladimir Il'ich Lenin devoted constant and tremendous attention to organizing party-political work among Red Army soldiers. On his instructions the party sent its best forces into the army for political work. The legendary commissars included A. S. Bubnov, K. Ye. Voroshilov, S. M. Kirov, S. B. Kosior, G. K. Ordzhonikidze, I. V. Stalin, I. S. Unshlikht, D. A. Furmanov, N. G. Tolmachev and many others. The commissars systematically appeared before the soldiers and commanders, explained the domestic and international situation and the goals and tasks of the just struggle of the Republic of the Soviets against the combined forces of interventionists and internal counterrevolution,

and they encouraged them by passionate words and personal example to fight for the glorious ideals of the revolution.

The leading and inspiring role of the Communist Party--the wise organizer, strategist and leader that had guided the Soviet people to victory--manifested itself with clear force in the civil war. "...it was only because the party stood guard," emphasized V. I. Lenin, "because the party was strictly disciplined, because the authority of the party united all departments and institutions, because tens, hundreds and thousands and, in the end, millions marched as one man in response to the slogan proclaimed by the central committee, and only because unprecedented sacrifices had to be suffered was the miracle which had occurred possible. It was only because of this, despite the second, third and fourth campaigns of imperialists of the Entente and imperialists of the whole world, that we were able to win" ("Poln. sobr. soch.," Vol 40, p 240).

Under the guidance of V. I. Lenin and the party of the Bolsheviks the young Red Army entered brilliant pages into the glorious chronicle of history's first socialist fatherland during the time of civil war and foreign intervention. The military deeds of the personnel of many formations, units and ships were noted by high awards and by the Honorary Revolutionary Red Banner.

The lesson leader should recall to the students that many of the units and formations that distinguished themselves during the civil war participated later on in the Great Patriotic War and are still part of the armed forces today. Among them, it would be desirable to name the division that bears the name of legendary V. I. **Chapayev**, the Iron Division and the Regiment imeni G. I. Kotovskiy. All whose fate it was to fight in behalf of Soviet power during the civil war, whose lot it was to endure the harsh trials of the Great Patriotic War and those who serve in the military today are united by faithfulness to V. I. Lenin's commandments, by devotion to the cause of the Leninist party and by a sense of personal responsibility for dependably protecting the socialist fatherland.

### 3. The USSR Constitution--the Embodiment of Lenin's Ideas on Development of a Socialist All-People's State and Its Armed Forces

Going on to the third issue, it should be recalled to the students that the USSR Constitution is the Fundamental Law of the life of our society. It was adopted following discussion by all peoples at an extraordinary session of the USSR Supreme Soviet on 7 October 1977. The Fundamental Law of the Soviet state reflects the grandiose achievements of the USSR in the stage of developed socialism and the major successes of our people in development of communism.

The constitution establishes, in the spirit of Lenin's commandments, the obligations of state organs, public organizations, officials and citizens associated with ensuring the country's security and strengthening its defense capabilities. In the person of its higher organs of power and control, the state handles the problems of war and peace, of protection of its sovereignty, of defending the state borders and the territory of the USSR, of organizing defenses, of managing the armed forces and of ensuring state security.

In compliance with the Fundamental Law the Presidium of the USSR Supreme Soviet, a permanent organ of the USSR Supreme Soviet, establishes military ranks and awards higher military ranks; it forms the USSR Defense Council and approves its composition, and it appoints and replaces the higher command of the USSR Armed Forces; it declares martial law in individual localities or throughout the entire country in the interests of the USSR's defense; it declares general or partial mobilization; in the period between sessions of the USSR Supreme Soviet, it has the power to declare a state of war in the event of a military attack upon the USSR or when it becomes necessary to fulfill international treaty obligations associated with mutual defense against aggression.

According to the constitution the USSR Council of Ministers, the highest executive organ of state power in the country, implements measures to ensure state security; it exercises overall leadership over the development of the USSR Armed Forces, and it determines the annual contingents of citizens subject to active military service.

Local organs of state government play a great role in defense missions.

Lenin's ideas on defending the socialist fatherland were embodied in the goals and purpose of our armed forces, which are standing guard over socialist accomplishments, over the peaceful labor of the Soviet people and over the sovereignty and territorial integrity of the state, and they were enacted into law in the USSR State Constitution.

The Fundamental Law of the Soviet state indicates in Chapter 5 the main paths of maintaining the motherland's defensive power and the battleworthiness of the army and navy. It is the duty of the USSR Armed Forces to the people to reliably defend the socialist fatherland and to be in constant combat readiness guaranteeing an immediate repulse to any aggressor.

Validating the objective need for dependably defending the state of the laborers, V. I. Lenin noted: "...we must be on guard. In no case can we say that we are guaranteed against war.... Therefore we must preserve our military readiness just in case. Despite the fact that we have already inflicted blows upon imperialism, we must keep the Red Army combat ready at all costs and enhance its battleworthiness" ("Poln. sobr. soch.," Vol 42, p 130).

No matter how much the mercenary bourgeois propagandists shout about a "Soviet military threat," they will never be able to refute the obvious fact that our armed forces have been created and presently exist in the name of the most valid goals--defending the accomplishments of Great October and the creative labor of the builders of the new society. The Soviet Union is improving its defenses and it is maintaining the army and navy in constant combat readiness namely owing to the aggressive designs of our class enemies in the international arena--the imperialists. "The militaristic course and aggressive policy of the NATO bloc, headed by the USA," noted Comrade L. I. Brezhnev in a speech to the 17th Congress of USSR Trade Unions, "compel us to take steps to maintain the country's defense capabilities at the required level. This is a harsh necessity of today's world, and of course it requires that we distract sizeable assets at the expense of our plans for peaceful construction. But as I have said many times before, we are not spending, and we will not spend, a single

ruble for these purposes above the amount which is absolutely necessary for ensuring the security of our people and our friends and allies."

The 26th CPSU Congress thoroughly analyzed the international situation and pointed out that world imperialism has assumed a course of subverting detente, spiraling the arms race upward, implementing a policy of threats and interference in foreign affairs and suppressing the struggle of liberation. Adventurism and the preparedness to stake mankind's vital interests on their own narrow self-interested goals are especially manifested in the policy of the most aggressive circles of imperialism. There are people in the West who take every chance to say that the leading country of NATO--the USA--must be stronger than all others in the world, that the North Atlantic bloc must increase its nuclear arsenals, and in this way it must exert pressure upon the Soviet Union and other socialist countries.

Such declarations do not remain just empty words. They enjoy practical embodiment in the militaristic plans of the imperialist states and in their concrete military preparations. Specialists of a certain American scientific institute estimated that between 1946 and 1975 the Pentagon examined the issue of a nuclear attack against the USSR on four occasions.

In the last few years, especially with the coming to power of the Reagan administration, allocations for military purposes have risen dramatically in the USA. While in 1960-1980 the Pentagon's expenditures tripled, they increased by 2.2 times in just the current five-year plan, and in 1985 they will total more than \$300 billion. The main emphasis in the "strategic program" announced by the White House for the 1980s is on intensifying the combat possibilities of intercontinental ground-based missiles, strategic missile aviation and atomic submarines carrying ballistic missiles.

The USA's decision to produce neutron and chemical weapons is increasing the threat of war. NATO plans foreseeing deployment of about 600 launching pads in West Europe for new medium-range American missiles capable of attaining targets deep in USSR territory present a great danger. Japan, in which militarism is raising its head higher and higher, is also being drawn into the orbit of the USA's aggressive policy.

When we talk about the military preparations of imperialism we imply activation of the efforts of imperialist intelligence agencies, which are attempting to do harm to the defense capabilities and interests of the Soviet state. Thousands of agents, billions of allocations, numerous "strongpoints" over the entire globe and the most sophisticated technical innovations are all being actively used against the USSR and other socialist countries and against the democratic movement by the USA's Central Intelligence Agency, the main base of imperialist diversions.

Thus the present course of imperialism, and mainly of American imperialism, is intensifying the military danger. This is why it is especially important for soldiers of our army and navy to adhere to Lenin's order without fail today--to be always on guard in the face of imperialist threats and dangerous plans, to be in constant combat readiness. And it is also their responsibility to study military affairs in due fashion.

The need for constantly improving the combat readiness of the Soviet Armed Forces is also dictated by the nature and features of a possible war, and primarily by the greater importance of the time factor and the requirements of joint defense of the accomplishments of socialism in coordination with armies of other states in the Warsaw Pact.

Next it would be important to note that our army and navy have changed beyond recognition and transformed qualitatively together with the entire country in the postwar years. Owing to the selfless labor of the Soviet people they have everything they need to solidly shield the peaceful labor of our people against all transgressions from without, and to offer an annihilatory repulse to an aggressor, no matter from where he appears. USSR Minister of Defense Marshal of the Soviet Union D. F. Ustinov noted in a report to the Sixth All-Army Conference of Primary Party Organization Secretaries that combat readiness is the main indicator of the qualitative state of the troops and naval forces. It is the accumulation of the results of the multifaceted activities of commands, political workers, staffs, political organs, party organizations and all personnel of the armed forces, and of their capability for performing their main mission--dependably protecting socialist accomplishments and the peaceful labor of the Soviet people, and ensuring the security of our country and its friends and allies.

Most formations, units and ships successfully completed the winter training period of the current year. Its results and the course of the socialist competition show that the personnel have a correct understanding of the party's present requirements of the armed forces, and that they are laboring selflessly to fulfill them.

In the summer training period, which has now started, soldiers of the army and navy are directing their energy at achieving a maximum payoff from each day of combat training and at effectively promoting growth of their skill and proficiency. From day to day the socialist competition among the personnel for an honorable welcome to the 60th anniversary of formation of the Union of Soviet Socialist Republics under the slogan "Reliable Protection to the Peaceful Labor of the Soviet People!" is widening. Soldiers of the army and navy are laboring untiringly to fulfill decisions of the 26th CPSU Congress associated with raising the combat readiness of the armed forces and ensuring dependable protection of the state interests of our motherland.

As V. I. Lenin taught and as is required by our party, Soviet soldiers believe it their patriotic duty to defend the socialist fatherland and to maintain constant combat readiness guaranteeing an immediate repulse to any aggressor. They are persistently learning to use weapons and military equipment proficiently, they are achieving a high level of combat and political training, and they are zealously fulfilling the requirements of the oath and the manuals. To them, constant combat readiness is the will of the times. It makes the USSR Armed Forces a dependable bulwark of the security of the Soviet people and of its allies and friends.

A letter of greetings sent by soldiers of the USSR Armed Forces to the 19th Komsomol Congress states: "We report that in fulfilling the decisions of the 26th Congress of our party, Soviet soldiers are alertly protecting the sacred borders of the fatherland. Improving field skills, challenging the skies beyond the clouds and subjugating the oceanic depths, we are learning the science of winning. The top-class combat equipment and weapons created by the labor and genius of the Soviet people and entrusted to us by the motherland are in dependable and competent hands."

For independent study, it should be recommended to the students to read the sections "The Leader of the October Revolution" and "The Founder of the World's First Socialist State" in the book "V. I. Lenin. Kratkiy biograficheskiy ocherk" [V. I. Lenin. A Brief Biographical Sketch], and to study the 16 December 1979 CPSU Central Committee decree "On the 110th Anniversary of the Birth of V. I. Lenin." The students should study sections of the report by Comrade L. I. Brezhnev "Accountability Report of the CPSU Central Committee to the 26th Congress of the Communist Party of the Soviet Union and the Party's Current Tasks in Domestic and Foreign Policy" ("Materialy XXVI s"yezda KPSS" [Proceedings of the 26th CPSU Congress], pp 3-4, 20-31, 66, 69-80); they should also read the report given by CPSU Central Committee Politburo member Yu. V. Andropov at a solemn meeting in Moscow dedicated to the 112th anniversary of V. I. Lenin's birth (PRAVDA, 23 April 1982), and Chapter 3 of the political lesson training aid "V. I. Lenin o zashite sotsialisticheskogo Otechestva" [V. I. Lenin on Defending the Socialist Fatherland] (Voyenizdat, 1981).

During the time devoted to studying this subject, all possibilities should be utilized to acquaint the soldiers with recollections of V. I. Lenin by his closest fellow workers and old Bolsheviks. They should see the movies "Lenin in October," "Lenin in 1918," "Stories About Lenin," "Man With a Gun," "Red Square" and other creative, popular science and documentary films and film strips devoted to V. I. Lenin. Wherever the possibility allows, trips to museums and exhibitions describing V. I. Lenin should be organized, as should meetings with party veterans.

Examination of the following issues is recommended in the seminar (discussion):

1. V. I. Lenin's historical role in preparing and conducting the Great October Socialist Revolution.
2. V. I. Lenin's multifaceted activity in creating the Soviet state and building an army of a new socialist type.
3. V. I. Lenin's military activity and his guidance of the armed struggle of our people and the combat activities of the Red Army against foreign interventionists and White Guards.
4. What do the USSR Constitution and the decisions of the 26th CPSU Congress say about defending the socialist fatherland?
5. Why is it necessary to comply strictly with Lenin's commandments of maintaining the army and navy in constant combat readiness?

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4. "Konstitutsiya [Osnovnoy Zakon] Soyuza Sovetskikh Sotsialisticheskikh Respublik" [Constitution (Fundamental Law) of the Union of Soviet Socialist Republics], Preamble; articles 1-6, 31, 32, 62, 63.
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13. "V. I. Lenin i Sovetskiye Vooruzhennyye Sily" [V. I. Lenin and the Soviet Armed Forces], 3d edition, supplemented, Voenizdat, 1980.
14. "We Serve the Soviet Union! Letter of Greetings From Soldiers of the USSR Armed Forces to the 19th Komsomol Congress," KRASNAYA ZVEZDA, 22 May 1982.

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## ARMED FORCES

### REVIEW OF BOOK ON URGENT PROBLEMS OF SCIENTIFIC COMMUNISM

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 12, Jun 82 (signed to press 3 Jun 82) pp 90-92

[Article by doctor of philosophical sciences, professor, Maj Gen Avn V. Khalipov: "New Training Aid on Scientific Communism"]

[Text] The Military Publishing House has published a textbook "Urgent Problems of Scientific Communism" intended for students of military academies, universities of Marxism-Leninism, Marxist-Leninist training groups and party schools in the army and navy.\*

This book, which consists of 18 chapters, examines the problems of socialist and communist development, reveals the basic traits of developed socialism and the experience of defending the socialist fatherland and the revolutionary accomplishments of the laborers, and it analyzes the deepening general crisis of capitalism and growth of the world revolutionary process.

On the whole the textbook successfully distinguishes the urgent problems of modern social development, characterizes them thoroughly, and comprehensively demonstrates the dialectics of the arising, formation and function of the communist socioeconomic formation, both within the framework of individual nation states and on a world scale.

One positive aspect of the publication is the treatment of a number of important problems of scientific communism which have not been fully illuminated in the available training literature. Among them are, for example, a thorough analysis of problems associated with the social policy of the Marxist-Leninist parties of the socialist countries, organic combination of the achievements of the scientific-technical revolution with the advantages of socialism and further development of the creative activities of laborers and Soviet soldiers.

The first chapter demonstrates the integrity and multifaceted nature of the Marxist-Leninist teaching, the specific features of the object of scientific communism, its functions, method and basic characteristics, and the innovative

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\*Aktual'nyye problemy nauchnogo kommunizma. Posobiye dlya voyennykh akademiyy" [Urgent Problems of Scientific Communism. Textbook for Military Academies], (edited by V. I. Kondrashov, V. F. Molchanov and V. V. Serebryannikov). Voenizdat, 1981, 456 pp.

approach taken by the CPSU to development of revolutionary theory. The next chapter presents the essence and content of Lenin's theory of socialist revolution. As the gigantic experience of the 20th century shows, this theory is a dependable compass of the working class and of all laborers in the struggle for fundamental revolutionary renewal of the world and for the transition from capitalism to socialism. A deep understanding of the general laws governing maturation and development of the socialist revolution, the diversity of its ways and forms and creative enrichment of this area of theory with a consideration for the new phenomena of world development acquire special significance in today's conditions.

The victory of Great October initiated the era of transition of all mankind from capitalism to socialism. This era, as the book shows, demonstrates the triumph and confirms the unfading value and growing significance of the fundamental premises of Lenin's theory of socialist revolution. The authors of the textbook reveal the content and basic contradictions of the modern era, and its motive forces and prospects.

A chapter titled "The World Historic Mission of the Working Class and Its Marxist-Leninist Party" reveals the historic contribution made by Marx, Engels and Lenin, who saw in the face of the proletariat the decisive force of a fundamental, revolutionary alteration of society on a socialist basis. From the moment of its arising and entry into the arena of history as a revolutionary force, the working class demonstrated high organization, consciousness and heroism never before witnessed in history and never before displayed by any other class. This great world historic role expressed itself especially clearly in the main event of the 20th century--the Great October Socialist Revolution and in the practice of the creation and defense of the new society. The book reflects the forms of the outstanding mission of the international working class, and it analyzes the composition, tasks and goals of its main detachments. The authors persuasively and thoroughly present the basic provisions of Lenin's teaching on the party of the new type, they demonstrate how this teaching is being consistently implemented, and they reveal the content of the activities of the international communist movement, the most influential political force of modern times. "The main thing," emphasized the 26th CPSU Congress, "is that communists armed with the teaching of Marxism-Leninism are able to envision the essence and prospects of processes occurring in the world deeper and more correctly than anyone else, and that they are making correct conclusions from this in relation to their struggle in behalf of the interests of the working class, the laborers of all countries, democracy, peace and socialism."

A group of chapters provides a clear and elaborate description of all of the revolutionary forces of modern times: the world socialist system, the workers' movement in industrially developed capitalist countries and the national movement of liberation. The authors were able to competently and skillfully explain the essence and ways of growing influence of the world socialist system upon social progress, and to demonstrate the growth in preconditions for new socialist revolutions in the face of the deepening general crisis of capitalism, the basic traits and problems of the national liberation movement in the modern era, and the laws and features of the development of countries with a socialist orientation.

The book devotes its main attention to the communist socioeconomic formation and to the place and role it plays in developed socialist society. This section of the work under review here begins with an analysis of the viewpoints of the classicists of Marxism-Leninism, who deeply developed the teaching on the periods of a communist formation. Three phases are inherent to it: a period of transition from capitalism to socialism, and socialism and communism--two phases of communist society. The law of forward movement of a social system, of its transition from lower to higher forms, formulated by the founders of scientific communism, was the methodological basis for determining these phases. The criteria used in distinguishing these phases were, first, the level of development of productive forces and, second, the maturity of productive and all other social relationships.

The practice of creating a new society in the USSR and in other socialist countries confirmed the truth of the Marxist-Leninist conception of the arising and development of a communist formation, and showed that it is the theoretical base for development of a correct policy of social transformations and for control of social processes.

Chapters devoted to a multifaceted description of developed socialist society are highly interesting. They examine the urgent problems of its vital activities and reveal the outstanding results achieved by our people under the guidance of the CPSU in all of the principal spheres of life, and the laws and ways of further economic and social development of the USSR in the 1980s. The attention of the readers is attracted to the problem of achieving an organic combination of the accomplishments of the scientific-technical revolution and the advantages of socialism. The textbook reveals the essence and features of the modern scientific-technical revolution and evaluates its influence on growth of the defense capabilities of the country and the USSR Armed Forces.

The author collective examines the social policy of the CPSU and of fraternal communist and workers' parties in a close relationship with an analysis of the economic strategy and tactics of these parties. The essence of this policy is revealed on the basis of the fundamental theoretical and methodological premises stated by V. I. Lenin. The textbook thoroughly describes social policy associated with socialist and communist development. Mention is made of its relationship to the particular features of the social and class structure of the society and to the trends of its movement toward complete social homogeneity, and the significance of such homogeneity to the strength of the country's defenses is emphasized.

Basing themselves on decisions of the CPSU congresses, the provisions of the USSR Constitution and the works of Comrade L. I. Brezhnev, the authors demonstrate the essence and characteristics of developed socialist society and its greater defense capabilities. Revealing the place of mature socialism in history, they analyze the basic laws of its transformation into communism.

The notion of developed socialist society is expanded in a chapter discussing the content and the most significant traits of the socialist way of life, including the way of life of soldiers, and the ways of its further improvement. A section of the book titled "Development of the Creative Activity of Laborers

in Construction of Communism. Social Activity of Personnel of the Socialist Army" is organically associated with these problems.

This textbook provides a picture of the wholesome political life of the country, saturated with deep content. The authors reveal the structure of our political system and its principal elements, and explain the main tasks and functions of the party and of the socialist all-peoples state, the mass public organizations and labor collectives, and the prospects for transition to communist social self-control.

The author elective was generally able to reveal the philosophical and methodological role of scientific communism in solving such problems as analysis of the modern military-political situation and the key problems of war and peace; development and implementation of military policy by the CPSU and fraternal communist and workers' parties; formulation and implementation of the defense doctrine of a socialist state; improvement of the military organization, and successive development of the combat potential of the armed forces.

In a special chapter the authors acquaint the reader with the basic traits of Lenin's teaching on defending the socialist fatherland and with the activities of the CPSU and fraternal parties aimed at creatively developing this teaching in the face of the growing aggressiveness of modern imperialism, especially American. The textbook turns attention to the basic provisions of the USSR Constitution which outline the supreme constitutional duty of our armed forces--dependably defending the socialist fatherland and being in constant combat readiness guaranteeing an immediate repulse to any aggressor.

The book demonstrates the basic stages and laws of development of the socialist army--an army of a new type, and it provides a clear impression of its essence, traits, principles of construction and place and role in socialist society. Emphasis is laid on the growing role of the Communist Party in leadership of the armed forces and on the need for strengthening and developing combat cooperation among armies of fraternal socialist countries. Many pages are devoted to criticizing bourgeois and opportunistic distortions of the essence and purpose of socialist armies.

But at the same time, in giving a general evaluation to the new textbook, we cannot unfortunately ignore the fact that some problems should have been illuminated more clearly and concretely. This pertains, for example, to the description of the laws of developed socialist society's transformation into communist society, which are illuminated to different degrees in different chapters. The essence of concepts such as the political system of society and its military organization should have been revealed more deeply. Editorial inaccuracies can be encountered on the pages of the textbook. The problems of legal and atheistic education were not reflected. However, despite these remarks the book does deserve a positive evaluation in general.

The textbook will doubtlessly be studied with great benefit by officers in the troops and in higher military educational institutions, and its premises and conclusions will promote improvement of ideological and political indoctrination of the personnel.

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ARMED FORCES

FOLLOW-UP REPORT ON PRESS COVERAGE

Moscow KRASNAYA ZVEZDA in Russian 28 Apr 82 p 2

[Report: "An Important Task of the Military Press"; Original article published in JPRS 80598 19 Apr 82 USSR Report: MILITARY AFFAIRS]

[Text] A review of the press published with the above headline on 24 March analyzed the performance of ZA RODINU, newspaper of the Red Banner Volga Military District, with respect to its coverage of questions pertaining to the strengthening of military discipline. Lieutenant General G. Gromov, member of the military council and chief of the district military directorate, has reported that the KRASNAYA ZVEZDA article was thoroughly studied in the district military directorate and by the editorial team. It was discussed at a meeting of the editorial board, at a party meeting and a special meeting of the editors. The assessments and the conclusions contained in the review were acknowledged to be fair. Steps were outlined to improve the quality and the variety of genres employed in coverage of the work performed by commanders, staffs, party and Komsomol organizations to strengthen military discipline and maintain firm regulation order in the units and subunits. Adjustments have been made in the editorial board's work plans, which are making it possible to give considerably more vitality to the work of publicizing advanced know-how in the training and indoctrination of the personnel and to make the newspaper's articles on matters of military discipline more effective.

11499

CSO: 1801 / 248

## ARMED FORCES

### MILITARY INNOVATORS, INVENTORS CITED

Moscow KRASNAYA ZVEZDA in Russian 28 Apr 82 p 2

[Article by Col V. Reznik: "The Strategy for the Quest"]

[Text] It is long since time to acknowledge that the most valuable and interesting account of an inventor could be that which the innovator wrote about himself. Naturally, Vladimir Fedorovich Blazhchuk knows more about himself and about what he has done than all of his friends, assistants, students....

"No, you're wrong," objected Colonel Blazhchuk, honored rationalizer of the RSFSR and author of many innovations capable of competing with the creations of some design bureaus. They could not only compete, but they could win. It never occurs to him to speak of himself. He has never once even thought of linking his technical quests and their results to the formal status of one in charge. It is just such devotees, however, who understand the needs of the troops, "from the word go," so to speak, steadily and unselfishly moving in the important directions, who are especially needed today. They know how to interest people, to lead them along.

...I had the opportunity to see an unusual helicopter in one of the units. It had rotor blades reduced in length and a short tail boom. As soon as the rotors began to turn, the helicopter taxied to the take-off point, rapidly gathered speed, then stopped and immediately sped off in the other direction. The tail was in front!

"It's on rails!" the officer accompanying me said with a laugh upon noticing my surprise.

"This is our trainer. Would you like to look at it"?

When we had drawn nearer, I saw that the helicopter cockpit had been set up on a tall metal girder mounted on rails. The trainer made it possible to practice using the combat weapon. The rotation of the blades created the typical vibrations of a hull, which also helped to make the firing conditions similar to those existing on a real flight.

"This is a useful thing," the officer said of the trainer. "The creation of Colonel Blazhchuk...."

I heard the name again soon after that, at a district conference of inventors and rationalizers. Many good things were said about Blazhchuk, and I developed a desire to become closer acquainted with the officer. The more I learned about him, the more distinct became the image of an individual who does not simply seek and find, but who does this with enviable singleness of purpose and does not accept simplifications.

I do not recall where I read this, but the thought has been retained in my memory. The designer's specialty is not an easy one. Like the architect, he must envision the future machine in distinct lines, in complex variations, mentally draw its outline and then transfer this to a blueprint, refine details and perform the complex calculations. The art of the inventor, creator of progressive equipment, lies in the ability to recognize its usefulness, to apply the latest scientific and technological achievements to its creation. This kind of quest has long since been placed into the category of creativity elevated to the level of artistic comprehension.

...That day Colonel Blazhchuk did not get back to town until after dark. "Lights, lights everywhere!" he thought to himself angrily. He was irritated by any source of light. When a police car with its flashing light rushed past, he followed it with his eyes and sighed: "The photodiodes may react even to this flashing light...." And it suddenly occurred to him: "What if I made an optical beam flash? And then make the photodiodes react only to the modulated light signal"?

This is how it actually began. Then there were refinements, and a "chain" of interacting devices was created. From the cockpit, mounted on a rocking frame, it would be possible to aim at a real target, at realistic distances, in realistic outside conditions. The optical beam duplicated, as it were, the actions of a tank crew on the trainer screen. By means of the photodiodes and a monitoring apparatus it "told" the instructor--and the crew, of course--how accurately they were aiming.

It would appear that this was the end of it, that the task had been accomplished. A problem arose, however: In the assembled circuit the photodiodes reacted not only to the sighting beam but also "responded" to other frivolously appearing light sources. The sun would come up, and the capricious elements would respond. And the quest, the testing began again....

Every invention is a revealed secret of technology. The secret in this case lay in the use of a modulated beam generator and the conversion of the signal amplifier. Yet another important feature had to be achieved, however--the work in the trainer had to be made interesting. "The tension of actual combat has to be felt in the trainer"--this is Vladimir Fedorovich's conviction. "And this involves a thousand trifles." He then listed these "trifles."

Why try to embrace the unembraceable, some might ask.

His own personal opinion is inserted at this point.



"I believe that in trainer technology he who has decided in advance that it is impossible to embrace the unembraceable will never do anything at all," Colonel Blazhchuk says.

The trainer created by Vladimir Fedorovich and the volunteer creative team headed by him is remarkable in that it "analyzes" errors and the trainer can see at each stage how long it has taken him to observe and select a target, whether he has correctly determined the initial data for the first shot, whether he has accurately hit the target, how well he has tracked the target, and a great deal more. In short, Blazhchuk's trainer produces a situation close to reality, with objective control and a changing background for the game.

I heard words of praise about Blazhchuk's devices from unit commanders, and about the inventor's design discoveries and his extensive erudition. I did not immediately grasp the secret of his success, however. It lies in the fact that the innovator proceeds by developing the "individual blocks," each of which is an important, independent part. It is thought out and created so that it can be perfected. And therefore, so that it will have a long life. A life lasting many years.

Blazhchuk's inventions account was opened with several author's certificates at once. These were followed by others, but the first were precious in that they were the first, in that they were rapidly adopted.

Things did not always go so smoothly, however. Take the following example, which has to do with the adoption of a company tactical complex. It was created long before the industrially produced model appeared. More than just one year the skilled soldiers "pushed" to have it accepted for production. Blazhchuk was told: "We have already placed our order for an industrially produced model. We already have the blueprints, and things are already being set up for production! Get busy on something else." He objected: "Ours has been tested. It performs excellently in any kind of weather. We have documents and testimonials!...."

With permission from command the innovator set up his own creation during the field tests of the factory-produced complex. His functioned without a single breakdown. Subsequent competitive tests were also successful. The commission decided: "Put V. F. Blazhchuk's trainer into production."

Victories are not easily gained. The amateur creative team headed by Communist Blazhchuk, however is always oriented only toward them. Majors V. Savel'yev and V. Platonov, Soviet Army employees, A. Zadunayevskiy, honored rationalizer of the RSFSR, A. Pashkin, P. Fedotov, S. Kirillov and others have dozens of clever technical designs to their credit--and this means dozens of victories in the difficult quest.

It was precisely for his tireless creative quest that Colonel Blazhchuk was awarded two Orders of the Red Star and the Order of the Patriotic War, first degree, during the Great Patriotic War, and the "Badge of Honor" order in peacetime. Recently,

when Marshal of the Soviet Union D.F. Ustinov, USSR minister of defense, had inspected the training facility of one of the formations, he awarded Colonel Blazhchuk a watch with his name inscribed on it.

For 40 days Vladimir Fedorovich has been loyal to his calling. Mechanic, tank driver, electrician and radio enthusiast, designer and inventor, he is still full of creative ideas today. Their realization will make it possible to shorten the path to the pinnacles of combat skill for the fighting men.

11499

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## ARMED FORCES

### EDITORIAL KEYED TO INCREASED VIGILANCE

Moscow KRASNAYA ZVEZDA in Russian 4 May 82 p 1

[Editorial: "Following the Course of New Achievements"]

[Text] The Soviet people and workers of the fraternal socialist nations, all of progressive mankind, grandly commemorated the 1st of May, the day of international solidarity of the workers in the struggle against imperialism and for peace, democracy and socialism. Mass demonstrations by the workers took place in Moscow, the capital of our homeland, in Leningrad, cradle of the Great October Socialist Revolution, and the Union republic capitals. Formal activities and public celebrations took place in all the cities and villages of our vast nation. A joyful, uplifted mood reigned throughout.

The approaching 60th anniversary of the founding of the Union of Soviet Socialist Republics gave a special distinction to the festive ceremonies. The Soviet Union today sets an example for the entire world of an amicable family of equal republics jointly building communism. Our society has solid social, political and ideological unity. The Soviet people are indestructibly united round their Communist Party and its Central Committee, headed by Comrade L. I. Brezhnev, loyal continuer of the great Lenin's cause. The May Day celebration turned into a brilliant demonstration of popular support for the party's foreign and domestic policy, of the Soviet people's unbending resolve to implement decisions coming out of the 26th CPSU Congress. This resolve is being backed up with deeds. In the socialist competition which has been launched in honor of the 60th anniversary of the founding of the USSR, the workers of all the republics, krays and oblasts are setting remarkable examples of shock labor, putting unutilized reserves to work and doing everything possible to successfully fulfill the 1982 plan and the five-year plan as a whole.

"Accepting the decisions of the 26th party congress as their own vital cause," Comrade L. I. Brezhnev noted in his speech at the 17th Congress of Trade Unions of the USSR, "the Soviet people are moving ahead with firm confidence in their abilities, with a clear understanding of both the difficulty and the grandness of the tasks facing them. This is producing a smooth work tempo in the nation and insuring that the rural and urban workers perform conscientiously."

The nation's workers are beginning their May work watch from the high goals achieved during the first months of the year. The Central Statistical Administration of the

USSR has reported that the nation's industry fulfilled the plan for the first quarter with respect to total volume and to the output of the majority of the most important types of items. We have exceeded the plan for gas extraction, production of metal-working lathes, instruments, means of mechanization and computer equipment, electric locomotives, motor vehicles, certain kinds of agricultural equipment and excavators, as well as sewn goods, timepieces, television sets, furniture and many other consumer goods. Relying upon what they have already achieved, the industrial workers are filled with determination to enlarge their contribution to the five-year plan. Intense work is under way today in the nation's fields. The agricultural workers are countering the caprices of the weather with increased skill, improved organization of labor and progressive technology.

Inspired, selfless labor is the source of all our riches. The mightiness and the flourishing of the homeland and the well being of the Soviet people depend upon the efforts of each and everyone of us, upon how effectively the Tyumen' oilfield workers and the tunnel builders and track layers on the BAM work, upon those who are creating the powerful vital components of the future nuclear power plants at "Atomash," those who carefully place the wheat and cotton seeds into the spring earth, those who teach the children and those who look after the people's health. This is why the party is calling upon the nation's workers to increase productivity and improve effectiveness and the work quality at each work station, to create in each collective a climate of creativity, comradely mutual assistance and a sense of great responsibility for the fulfillment of plan assignments. Organization, efficiency and discipline--inseparable features of socialist management--are an extremely important condition for the successful accomplishment of all the tasks.

The people marched in columns of demonstrators through the squares and streets of the cities and villages with a feeling of pride for our Soviet homeland, which is in the vanguard of mankind. The Soviet individual is the master of his country. All areas of public life are open to him. His political activeness has been brilliantly demonstrated during the preparations for elections to the local soviets of people's deputies. The best representatives of the working class, the kolkhoz peasantry, the popular intelligentsia, army and navy fighting men are being advanced as candidates for deputies.

The 1st of May is called a celebration of spring and of youth. As always, the youth, worthy heirs to the revolutionary, combat and labor traditions of the party and the people, marched alongside the veterans and middle-aged people in the columns of demonstrators. They have made an important contribution to the creation of communism. "For the 11th Five-Year Plan--Shock Labor, Learning, Initiative and Creativity of the Youth!"--this is the slogan with which the nation's young men and women are moving toward the 19th Komsomol Congress, which opens in May.

Our course is a course of new achievements. We are led along it by the wise party of Lenin. We need peace in order to implement the plans outlined by it. "Labor" and "peace"--these words stood next to each other on the festive posters and transparent banners. We cannot ignore the international situation, however, drastically exacerbated through the fault of imperialism. We cannot fail to be alarmed at how the forces of reaction, primarily American imperialism and its accomplices, are fueling hotbeds of tension in various parts of the world, crudely interfering in

the affairs of sovereign states and conducting unrestrained psychological warfare against the Soviet Union and the other socialist nations, against the forces of peace and social progress. The policy of China's leaders is contributing to the designs of imperialism's most aggressive circles.

All of this requires that the Soviet people and their fighting men demonstrate political vigilance and work tirelessly to maintain the army and navy in a state of good combat readiness to deal a decisive rebuff to aggression, wherever it might originate. And our Armed Forces are always in such a state of readiness. The concern of all the people gives them insuperable power and nourish their indomitable moral and political, social and international solidarity. In single combat formation with the fraternal armies of the Warsaw Pact states, they are vigilantly and reliably guarding the peaceful labor of the Soviet people and socialism's great gains.

The Soviet people have celebrated May Day filled with optimism, in the flower of their creative strength, with glorious achievements for the sake of the homeland. Closely united round Lenin's party, they are confidently advancing along the course of new achievements, along the path of communist creation.

11499

CSO: 1801 / 248

## ARMED FORCES

### APRIL MAILBAG REVIEWED

Moscow KRASNAYA ZVEZDA in Russian 4 May 82 p 2

[Article: "The KRASNAYA ZVEZDA Mailbag"]

[Text] The editors received 10,623 letters from readers in April of 1982, 478 of which were published in the newspaper. KRASNAYA ZVEZDA received 709 letters in response to the articles.

Our people and their Armed Forces conducted an All-Union communist, unpaid mass workday dedicated to the 112th anniversary of V. I. Lenin's birth. It was held in an atmosphere of great political and labor enthusiasm. The April mail widely reflected this important event. With their thoughts and ideas focused upon Il'ich, the authors of many letters to the editors are writing about the Soviet fighting men's desire to learn as much as possible about the leader's life and report on Lenin lessons and readings and trips to sites linked to Lenin, which are held in the units and on the ships, and about the results of this past unpaid mass workday.

"Fighting men of the repair and reconstruction battalion commanded by Lieutenant Colonel V. Tyumentsev worked that day in the shock-labor spirit. The brigades headed by Captain A. Murachev, Lieutenant A. Perekhod'ko and Senior Warrant Officer A. Artyukhov did a good job of repairing the combat equipment," Senior Lieutenant D. Karimov of the Central Group of Forces reports to the editors. Senior Lieutenant A. Vdovin writes about how the Siberian fighting men gathered many tons of ferrous and nonferrous scrap metal and shipped it to industrial enterprises of the Kuzbass.

Reports like this--and there are many in the editors' mailbag--tell us that the Soviet fighting men perform with inspiration and enthusiasm on the Lenin communist unpaid mass workday. In April many of them completed the winter training period with good results, completely fulfilling their socialist commitments. Colonel V. Shkvorov of the Leningrad Military District, as an example, tells how personnel of the motorized rifle battalion commanded by Captain D. Aliyev demonstrated good tactical and fire training in the exercises. Success in the battle was predetermined with a surprise attack by his subunits, delivered to the "enemy's" rear area by helicopter.

Letters from the tactical exercise fields, flights and long cruises convincingly attest the fact that army and navy personnel, like all the Soviet people, are preparing a fitting reception for a historic event in our country's life--the 60th anniversary of the founding of the USSR.

Active preparations are under way in the units, on the ships and in the military educational institutions and establishments for elections to the local soviets of people's deputies. Major V. Knyazev of the Baltic Military District writes: "Colorful calendars, display stands and posters have been made up in the Lenin rooms of unit 'X,' which tell the election date, as well as electors' nooks. An agitation point is at work. Lieutenant Colonel Ya. Vanag, Major V. Novikov, Captain A. Shumilin and Warrant Officer A. Gudkov present lectures and talks to the fighting men. The party and Komsomol activists are giving special attention to those fighting men who will be taking part in elections for the first time."

"The communications training battalion recently received a letter from the taiga settlement of Chulyy" reports V. Dezhnev of the Siberian Military District. "It was written by V. Osadchiy, leader of the best brigade of railway engineers on the West Siberian Railway and deputy to the settlement soviet. The well-known brigade leader inquired about the work of private Ye. Kumzerov, a former member of their communist labor team. He told about the affairs of the railway workers, who have taken up shock watch in honor of the forthcoming elections to local soviets. The military signalmen reported to the soldier's fellow countrymen that Yevgeniy Kumzerov is fulfilling the mandate of the workers' collective with honor and has become an excellent trainee. During the days of preparation for the elections the campaign for the excellent performance of each combat training task is being expanded among the signalmen."

The month of April is on the eve of the 37th anniversary of our Victory in the Great Patriotic War. Many letters have been received from the frontline fighters during this spring month. They share their memories of the courage and heroism demonstrated in the fierce engagements with the enemy by members of their regiment, and express their sincere gratitude to their own Communist Party and the Soviet Government for their concern for the frontline fighters.

Loyalty to the combat traditions and a great sense of duty on the part of the heirs to the combat glory of those frontline fighters are motivating the Soviet fighting men to work tirelessly to perfect their military training and to vigilantly and reliably guard the great conquests of socialism. They greeted the first of May, international celebration of the solidarity of workers, with new successes in their service and training.

11499

CSO: 1801/248

## ARMED FORCES

### SOROKIN ON MILITARY PRESS

Moscow KRASNAYA ZVEZDA in Russian 5 May 82 p 2

[Article by Adm A. Sorokin, first deputy chief of the Main Political Directorate of the Soviet Army and Navy: "The Great Calling of the Military Press"]

[Text] Today, on Press Day, when our nation celebrates the 70th anniversary of the newspaper PRAVDA, we note with special pride how far the party press has advanced in its development, how enormous the influence it has upon the minds and the affairs of the Soviet people, upon the society's entire spiritual life.

Our press is the party's battle weapon. Its emergence and its development are inseparably linked with the name V. I. Lenin, founder of PRAVDA, who laid down the principles underlying communist party journalism.

Under developed socialism, the mass information and propaganda media, including the press, will become even more active accelerators of the processes characterizing our society's development on the road to communism. Stressing the importance of restructuring certain areas and spheres of ideological work, L. I. Brezhnev stated at the 26th party congress: "We need to make its content more current and see that it meets today's needs and demands of the Soviet people with respect to forms."

The demands set for ideological work at the 26th CPSU Congress define the functioning of all editorial teams, including journalists for the military press.

Military press makes its contribution to the communist indoctrination of the fighting men and to the development of the spiritual strengths of the army and navy. It actively propagandizes Lenin's ideological and theoretical heritage and the CPSU's foreign and domestic policy, and directly affects efforts to improve the quality of combat and political training for the fighting men.

The active stance taken by the military press is clearly demonstrated in its propaganda of decisions coming out of the 26th CPSU Congress and its explanatory work pertaining to principles and conclusions contained in the works and speeches of Comrade L. I. Brezhnev and other leaders of the party and the Soviet State. The editorial teams are engaged in a creative quest making it possible to find interesting ways of presenting propaganda material and to employ genres permitting them to reveal in a more convincing manner the rich ideological content of decisions



coming out of the 26th CPSU Congress and their power of inspiration. In this respect the military reader will find numerous substantive articles on the pages of KRASNAYA ZVEZDA under the headings "Developed Socialism: Advantages and Achievements" and "Our Soviet Way of Life," in district, group and fleet newspapers and in the magazines. Voennoye izdatel'stvo's publication of pamphlets with the title "Decision of the 26th CPSU Congress--Into Effect" was a notable event in the spiritual life of the army and navy.

Soviet journalism has an adequate arsenal of means to give a graphic account of the historic gains and the advantages of socialism, to demonstrate the inviolable unity of the party and the people, the solidarity and the insuperable strength of the fraternal alliance of our nation's peoples. The military newspapers and magazines describe the theoretical principles set forth in the decree passed by the CPSU Central Committee "On the 60th Anniversary of the Founding of the Union of Soviet Socialist Republics." The magazine SOVETSKIY VOIN, the newspaper SOVETSKIY SOLDAT (Central Group of Forces) and other press organs have carried a number of stirring articles on the heroic path covered by history's first unified and allied, multinational state of workers and peasants, on the destinies of Soviet people, the feats performed by the homeland's defenders, the successes achieved by the Union republics and the inviolable friendship of the Soviet peoples.

Extensive possibilities for publicizing the great gains and the advantages of socialism are being opened up for the newspapers and magazines by an important political campaign under way in the nation and in the Armed Forces--preparations for elections to local soviets of people's deputies and for the elections of people's judges of rayon (city) people's courts. Coverage of this extent, when deputies of local soviets, people's judges and people's assessors are being elected at the same time, is being done for the first time. The newspapers and magazines are expected to demonstrate the triumph of socialist democracy, of real power by the people in our nation, graphically and using concrete facts.

In the situation in which clouds have gathered once again in the international arena through imperialism's fault, the military press is doing a great deal to expose the aggressive policy of the United States and its NATO allies, and the anti-Soviet designs of various kinds of bourgeois politicians and military figures. The intensification of the ideological struggle, a struggle for the minds and the hearts of people, calls for further enhancement of our ideological weapon's effectiveness and aggressiveness. It must become even more refined and focused. We are expected to counter the class enemy's false assertions more actively with the truth about socialism and with the peace-loving policy of our party and our state.

Propaganda of the historic mission of the Soviet Nation's armed forces--to be a reliable guard over the gains of socialism and the creation of communism--is acquiring great current importance. Many newspapers and magazines are discovering interesting ways of presenting material describing the CPSU's concern for strengthening the nation's defense capability and improving the combat strength of the Armed Forces, the great significance of the Soviet fighting man's patriotic and international duty and the public importance of his military work and of good combat readiness on the part of the units and ships. Articles rich in content on these

issues are becoming a subject of discussion by a broad range of readers in a number of press organs, including the magazine VESTNIK PROTIVVOZDUSHNOY OBORONY and the newspaper GUARDING THE POLAR REGIONS (Red Banner Northern Fleet). This is helping them to gain a deeper understanding of their mission.

During these days in May the Soviet people and all of progressive mankind are commemorating the 37th anniversary of our Victory over fascist Germany. Preparations are under way on an ever-increasing scale in the nation for the celebration of the 40th anniversary of outstanding victories by the Soviet Army and Navy in the Great Patriotic War. A graphic depiction of the immortal feat performed by our people in that war and of the mass heroism demonstrated by Soviet fighting men will help us to raise to an even higher level the patriotic and international indoctrination of the personnel and the development in the youth of a readiness to follow the example of the heroes in all things.

The military press is doing a great deal to enhance party influence upon all aspects of the life and the work of the forces and to increase the militancy of party organizations. And today, when the All-Army Conference of Secretaries of Primary Party Organizations is about to begin, we should put in a good word about the newspapers and magazines, which have begun devoting greater attention to the party theme. Many articles carried in KOMMUNIST VOORUZHENNYKH SIL and the newspapers NA STRAZHE RODINY (Leningrad Military District) and KRASNYY BOYETS (Ural Military District) have unquestionably helped to increase the militancy of party organizations and to improve their performance.

Ahead of us lies the task of publicizing materials coming out of the conference and a struggle to implement its recommendations. It is the duty of military press agencies to summarize the party work experience, to make everything of value available to all the communists and to use convincing examples for describing ways of putting every party organization at the center of the daily ideological and indoctrinational work. Our district, group and fleet newspapers and KRASNAYA ZVEZDA should devote more attention to the practical adoption of positive experience in party work.

Subjects pertaining to the Komsomol have recently taken on greater vitality in the military press. The young fighting man finds articles in the newspapers and magazines, which describe the struggle being waged by army and fleet Komsomol members for a fitting reception for the 19th Komsomol Congress and to improve the quality of the military work and achieve exemplary fulfillment of their military duty. Decisions coming out of the congress of young Leninists will serve as a stimulus to continued improvement of the ideological and journalistic level of articles carried in the press on the life of the Komsomol organizations.

We do not exaggerate when we say that since the 26th CPSU Congress there has been a marked improvement in the ideological and theoretical and the scientific and literary level of articles carried in the newspapers and magazines, that they have become more effective. The printers and publishers have done a great deal to improve the quality of the printed articles and the appearance of the publications.

Like any other of our celebrations, however, Press Day also provides us with a good reason to draw the attention of editorial and publishing teams to inadequacies, to unutilized reserves, to those aspects of the creative work of journalists which require further improvement. We refer primarily to the need to raise the quality and the popularity of our press propaganda and the journalistic level of newspaper and magazine articles. The 26th party congress underscored the fact that every article in a newspaper or magazine should be regarded as a serious talk with the people, who expect not only the truthful and prompt presentation of facts, but also a thorough analysis of those facts and serious summarizations.

Our newspapers and magazines are still carrying articles which do not delve deeply enough into life and lack creative clarification of the problems involved in training and indoctrinating the personnel, improving combat readiness and discipline, and are not presented with adequate preciseness and clarity. Not all of the journalists have learned, as required by the party, to translate into the language of stirring, vital and convincing images the statistical data describing the development of our nation, the heroic nature of our times, the beauty and real grandness of the working man--builder of communism and defender of the socialist homeland.

The military press is expected to provide more thorough coverage of combat training, to summarize the experience of the outstanding commanders and political workers, to present for discussion by the army and navy community problems whose resolution will contribute to continued improvement of the training and indoctrinational process and of the indoctrinational role of the Armed Forces of the USSR.

Not all military press agencies make skillful use of their rich array of genres for discussing the socialist competition process. The articles and reports from correspondents rarely tell how the competition winners have achieved their success and do not always succeed in revealing the mechanism of competitiveness, so to speak, or to demonstrate the moral aspects of the struggle waged by the fighting men for good ratings in the training and in their conduct.

The winter training period has ended in the Armed Forces. We can now study the results, summarize and equip ourselves with the positive experience and take a look at the deficiencies, in order to prevent their occurrence during the summer training period. And this period will be one of especially intense and important work. Exercises and tactical drills, intensive flights and firings and long cruises will make great demands of the knowledge and the mental and physical conditioning of the soldiers, sailors, sergeants and petty officers, warrant officers (praporshchik, michman) and officers. It is a matter of honor for the military press to give publicity to those excelling in the training, to help achieve a situation in which the good undertakings of communists and Komsomol members get off the ground more rapidly and become a standard of life for the military collectives.

The further strengthening of military discipline is a subject of permanent importance. Everyone knows that regulation order and organization provide a solid foundation for good combat readiness and a key to success in the training. Newspapers and magazines write about discipline. The authors of many of these articles,

however, seem to forget the changes which have taken place and which are occurring in the personnel and the technical equipment of the Armed Forces. New equipment and weapons have greatly altered the nature of modern combat, and this has sharply increased the importance of organization and order.

Marshal of the Soviet Union D. F. Ustinov, USSR minister of defense, underscores the fact that a high level of organization and firm regulation order give the troops and naval forces the ability to perform rapidly, precisely and with good coordination in any situation, and provide the basis for timely, strict and precise implementation of the training plans and programs, and for the achievement of maximum results from each drill. Our press must give careful attention to these aspects of military service, thoroughly analyze those processes and phenomena which define the state of military discipline, demonstrate the example set by the communists and Komsomol members in the observance of requirements contained in the regulations, and persistently publicize the moral code of the builder of communism.

The strength of our press lies in party leadership. The military councils and political organs direct the work of newspapers and magazines and increase the prestige of the press on a daily basis. They strive to see that there is local, proper reaction to critical articles in the press, that detected shortcomings are eliminated. Because of this there is growing ideological influence upon all aspects of army and navy life, upon the work of further improving the training and indoctrination of the fighting men. It is important to continue persistently indoctrinating the journalists and devoting attention to their professional training and their ideological and moral conditioning and to the creation of a creative climate in each editorial collective.

Like all Soviet journalists, the military press workers are honorably justifying the party's great trust. They will continue to do everything possible to see that the party's published word evokes in the hearts of the fighting men a desire to fulfill their sacred duty even better, to tirelessly improve combat readiness and to strengthen the fighting strength of the Soviet Armed Forces.

11499

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## AIR FORCES

### FLIGHT TRAINING: EFFECTS OF PARTY INFLUENCE DISCUSSED

Moscow KOMMUNIST VOORUZHENIYKH SIL in Russian No 12, Jun 82 (signed to press 3 Jun 82) pp 47-54

[Article by Col Gen Avn L. Batekhin, military council member, chief, Air Force Political Directorate: "To Fly Reliably, to Fly Without Accidents"]

[Text] The decisions of the May Plenum of the CPSU Central Committee elicited an enormous upsurge in the political activities and work of military airmen. As with all Soviet people, it is with deep satisfaction and avid approval that they are studying the report by CPSU Central Committee General Secretary Comrade L. I. Brezhnev "On the USSR Food Program in the Period to 1990 and the Measures of Its Implementation" and the plenum's decree, viewing these historic documents to be a new, distinct manifestation of the Leninist party's concern for the welfare of the people, for strengthening the country's power and for consistently implementing the course charted by the 26th CPSU Congress. In response to this concern, communists and all personnel are increasing their efforts in the fight to raise the intensity and improve the quality of military labor and to implement the directives spelled out in the greetings of the CPSU Central Committee to participants of the All-Army Conference of Primary Party Organization Secretaries.

From day to day the intensity of aerial combat training is growing in the units and subunits of the air force, and the socialist competition for an honorable welcome to the 60th anniversary of the USSR's formation under the slogan "Reliable protection for the peaceful labor of the Soviet people!" is assuming an increasingly broader scope. Commanders, political workers, staff officers and party organizations are mobilizing soldiers for quality fulfillment of party requirements and the missions posed by the USSR minister of defense, and at actively fighting to strengthen the combat readiness of the units and subunits, military discipline and organization.

The summer training period is a time of intense flying and tactical flying exercises, during which habits are reinforced and aerial skills are improved, the battleworthiness of airplane crews, flights and squadrons is raised and coordination with different branches of the ground troops and naval forces is worked out; it is a time of practical training for school cadets. With every week, the complexity of the combat training missions of the soldiers rises. This requires commanders and all personnel to acquire deep knowledge of their jobs, to exert much of their moral and physical strength, to understand how to coordinate their work with interacting units and subunits in terms of place, time and objective in the interests of achieving the main goal--high results in

aerial skills and combat applications, and to develop moral-political and combat qualities in the personnel necessary for victory over a strong, technically equipped, insidious enemy.

As we know, one of the main requirements imposed by the party on the motherland's defenders is that of being in constant combat readiness guaranteeing an immediate repulse to any aggressor. Such readiness depends on, in addition to many other factors, the reliability with which flight safety is ensured and the training and preparedness of flight crews, engineers, technicians and specialists of support subunits for actions in a complex situation and in extraordinary conditions.

The range of problems being solved by the personnel of all aviation arms and services has recently expanded significantly. In this connection the requirements on the quality of commander training, on the leadership afforded to flying, on the competency of officers controlling airplane traffic on the ground and in the air, on the special skills of the pilot and on his discipline and personal responsibility for the outcome of every flying assignment have risen.

Party organizations are active assistants to the commanders in the fight for consistent, unyielding improvement of the effectiveness of combat and political training and flight safety. The results of the winter training period once again persuasively confirmed that high results in training, service and socialist competition depend in many ways on the effectiveness of party influence upon all aspects of the life of the personnel. Successes are more substantial in those combat collectives in which communists act as real champions of responsibility, diligence and discipline and as true leaders of the competition in tasks and standards in all forms of aviation skills, and in which they serve as a model of fulfillment of functional responsibilities. "The situation and mood in labor collectives, and consequently the production indicators," noted Comrade L. I. Brezhnev in his speech to the November (1981) Plenum of the CPSU Central Committee, "depends in many ways on how well the communist works."

As with combat readiness, flight safety is ensured by people. This is why formation of high moral-political and combat qualities in the personnel has been and continues to be an important direction in the activities of party organizations and of all communists: unlimited devotion to the motherland, Soviet patriotism and socialist internationalism, psychological steadfastness, endurance, self-control and decisiveness, and the readiness to honorably perform one's constitutional duty in response to the first summons of the party and government. Full explanation of the decisions of the 26th CPSU Congress, the November (1981) and May (1982) plenums of the CPSU Central Committee, the directives contained in Comrade L. I. Brezhnev's speeches to the 17th Trade Union Congress and the 19th Komsomol Congress and the proceedings of the Sixth All-Army Conference of Primary Party Organization Secretaries to the soldiers in lectures, reports and group and individual discussions and by way of local radio broadcasting stations is at the core of ideological work. Ideological indoctrination, when conducted in close association with life and with the tasks at hand, promotes development of each soldier's love for his profession, subunit and unit, his desire to preserve and multiply glorious combat traditions and his readiness to devote all of his strength and energy to reinforcing combat readiness and ensuring flight safety.

No forms of influence upon the masses, V. I. Lenin said, can produce any better results than can the force of personal example. The struggle waged by communists for flight safety persuasively demonstrates how pertinent this directive is today. What is it that ensures stably high results in combat and political training and high aerial skill in, for example, the unit commanded by Lieutenant Colonel Yu. Yeroshenko? Among other components, we can name the exemplary attitude of CPSU members and candidates toward fulfillment of official and party obligations. Communist Yereshenko himself possesses deep political and military-technical knowledge and good organizational capabilities, he constantly expands his ideological outlook, and he is always improving his occupational proficiency and his combat skills. The executive officer is a model of unswerving compliance with the laws and rules of flying. He often gives substantial talks to subordinates on timely topics, he agitates and incites them with his words, and he leads them by his deeds. The regiment commander measures each of his decisions up to the high requirements of the party, and he determines what their educational consequences would be and how they would effect the attitude of the military airmen toward their work and toward one another. Relying on the party organization, the unit commander persistently develops each officer's sense of responsibility for his assigned area of work and creates an atmosphere of intolerability of shortcomings that reduce the flight safety level in the collective.

The personal example of communists in complying with the requirements of flight safety is a broad concept, if we do not interpret it simplistically. If a party member encourages others to be diligent but himself violates flight discipline and the rules of preparing the aviation equipment for flight, and deviates from the provisions of the military regulations and laws governing flying, hardly no one would listen to his appeals. Nor can much influence upon fellow servicemen be expected from a communist who, while being diligent himself, remains indifferent to the work and needs of his comrades. Such a party member loses much in the eyes of his fellow servicemen.

Today, one can rarely encounter an officer in the combat collectives who has but a superficial knowledge of aerodynamics and tactics or who suffers inadequacies in the operation of equipment on the ground and in the air. Why, then, do mistakes and near-accidents occur in the performance of flying assignments which are fully within the capabilities of those receiving such assignments? Thinking over this question and comparing and analyzing the facts, one involuntarily comes to the conclusion that this becomes possible as a result of a weakening of commander and party exactingness and of the influence of communists in the crews, squadrons, detachments and flight control groups in those places where the foundation of successful flying is directly laid.

It is precisely in such places, in the course of intense joint actions, that the achievements and mistakes of the soldiers are most fully evident, and that it is easiest to determine the sources of these achievements and mistakes and to find the most suitable form of individual work. And as we know, the latter includes not only discussions but also constant attention to the needs and demands of the people and the ability to share their joys and sorrows, to help them master the "secrets" of occupational proficiency and, when necessary, to strictly punish them for mistakes. In those air units in which commanders,

political workers and active party members account for all of this in their political indoctrination and organizational work, the aerial and combat skills are improving and the causes of flying accidents have been eliminated.

We can cite as an example the air regiment in which Officer V. Kvasha is a member of the party committee. A friendly, workable collective of communists has evolved here, and it serves as the political nucleus of the regiment, maintaining a healthy, creative moral-psychological climate within it. A spirit of unity, military comradeship, mutual responsibility and exactingness toward shortcomings reigns in relationships between the military airmen. At party meetings the communists regularly discuss the problems upon the efficient, high quality solution of which the organization and conduct of flying in full correspondence with the requirements of the documents regulating accident-free flight work depends. As a rule such party discussions are always objective and business-like. A deep personal interest in utilizing all reserves and possibilities for improving the work is sensed in all communists, and the decisions are implemented. In turn the party committee and the party bureaus of the sub-units invariably account for all of the valuable and sensible ideas proposed by the communists, and in correspondence with this they draw up or adjust the plans of their own activities.

The most serious attention is devoted in the regiment to infusing each communist with a sense of high personal responsibility for exemplary fulfillment of his official and party duties and for outstanding flying in the regiment. The party committee is constantly concerned with raising the ideological maturity and consciousness of the airmen, it makes sure that communists conduct regular purposeful work on the ground and in the air to prevent flying accidents, and it maintains unweakening surveillance over their participation in the fight for strict compliance with the requirements of the guidelines. Nor do party activists ignore important problems such as instilling diligence, endurance, self-control and the ability to act competently and with initiative in all situations in the personnel.

And it is no accident that the business-like style of work is inherent to most communists of the unit. Whether we look at increasing the class ratings of the aerial warriors and the engineers and technicians, or we talk about improving the quality with which aviation equipment is prepared for flying or about special training for the soldiers, or whether we are talking about any other problem having to do with flight safety, party members always try to display initiative, to reveal unutilized reserves and to place them into action. The active, principled activity of communists, to include members of the teacher training council, executives of the air engineering service, officers of the command post and other of the most competent specialists, helps to raise flight safety.

The objectiveness of party-political work and its payoff predetermine the overall successes in many ways: The regiment completed its winter training period with high results, and today the personnel are sparing no efforts to achieve new, even higher summits in occupational proficiency and in further improvement of combat readiness.



Much valuable experience in promoting flight safety was accumulated in the past months of this year by the party organizations of other leading air units and subunits. But the successes should not generate a sense of complacency, indifference and an uncritical attitude toward shortcomings in the communists.

It is with great disappointment that I must assert that we still have subunits in which the number of near-accidents is not decreasing. Quite understandably, we cannot condone such a situation, since any deviations in the organization of accident-free flying have a negative influence on combat readiness. And maintenance of the latter at the requirements of today is our sacred duty to the Communist Party and the Soviet people.

The need for being on guard is dictated by the modern international situation. Imperialist reactionary circles, seeking the cover of the notorious "Soviet military threat," are deliberately fanning the fire of the cold war and spending enormous assets on the arms race and on creating new, more-monstrous and sophisticated resources for exterminating people. "The militaristic course and aggressive policy of the NATO bloc, with the USA in the lead," said Comrade L. I. Brezhnev at the 17th Trade Union Congress, "compels us to take steps to maintain the country's defense capabilities at the required level." Under these conditions Soviet soldiers, including airmen, must display high alertness, and they must be constantly concerned for strengthening the combat readiness of the units and subunits.

Aerial combat training opens up broad possibilities for the personnel's further advance toward the summits of combat proficiency. But such objectives cannot be reached spontaneously. Much depends here on scientifically justified planning by communist executives of air regiments and squadrons and by officers of the staffs, services and supporting subunits. It is only if a responsible attitude and a scientific approach is displayed by these communists toward the training plans that a dependable foundation for efficient, rhythmical and high quality flight training can be laid, and that such training can proceed without accidents and near accidents. This means that the party committees and bureaus must work precisely with these categories of CPSU members to a greater extent on an individual basis.

Active introduction of the experience accumulated by the leading military collectives will doubtlessly promote improvement of the efforts to prevent flying accidents. How do the commanders and party organizations of our best units achieve accident-free flying? In my opinion several aspects deserve attention in this regard.

First of all in addition to participating in planned lessons and self-study, on the initiative of the party committee of the party bureau the officers organize exchange of experience by the best pilots, navigators and command posts and support subunit officers with fellow servicemen at a lower training level.

Second, fulfilling party instructions, communists holding the lead in the socialist competition provide help to airmen who, for one reason or another, has been unable to achieve high results in military labor. They teach the lagging soldiers the most sensible methods and procedures of work in different situations.

Third, every deviation from the requirements of the documents regulating flight training is evaluated strictly in accordance with party principles in the accident-free unit. The results are brought to everyone's awareness quickly, in such a way as to prevent rumors and misinterpretations. And this is the correct thing to do: All understatement of mistakes in flying and disregard of them aggravate the state of affairs in the final analysis, and undermine the authority of the party organization. Here, for example, is what happened in the unit in which Guards Major A. Ferlinskiy serves. During flying, one of the pilots made a gross error in piloting technique. The party committee secretary got together with the secretary of the squadron's party organization and thoroughly analyzed its causes. They decided to convene the subunit communists right at the airfield, to talk about the near-accident and to recall their personal responsibility for preparing for each sortie. Such a discussion was held, and it served as a good lesson for the entire collective.

Another valuable thing in the work experience of the party organizations of the leading military collectives is that the party committees and party bureaus make it a broad practice to periodically entertain reports not only from communists who violate the requirements of documents regulating flight safety in their daily activities but also party members who become satisfied with mediocre results in training and in service. On recommendation of the party organizations, the Komsomol committees and bureaus use the same method in indoctrination of Komsomol members. I think that there can be no doubt in anyone's mind as to the benefit from such an approach to preventing near-accidents in the air.

I would like to briefly dwell on yet another important problem. The professional competency of the executive staff and especially of commanders of all ranks plays the decisive role in the multifaceted activity associated with promoting accident-free flying. The age of executive flying personnel has decreased significantly in recent years. The young executive officers are well prepared in theoretical respects, but they have little practical experience. This must be taken into account when organizing and conducting flight training, and consequently in the entire complex of preventative measures associated with flight safety. It is very important for political workers and party organizations to account for the fact that young commanders need the most active support and concrete, effective assistance in their first efforts, so that they could confidently assimilate their new, complex responsibilities associated with training and indoctrinating subordinates, managing flight training and learning the fine points of their work.

We know that each pilot's fulfillment of his individual flight training plan is an indispensable prerequisite of his successful training and high qualifications. However, this basic truth is not fully understood by certain communist executives. There can be no other explanation for the fact that we can encounter pilots who have clocked few flying hours, especially in the complex forms of combat application, in some of the collectives. In the race to fulfill the plan for preparing for high class qualifications, such collectives often ignore the requirements of methodological consistency of training, and they close their eyes to deviations from the elementary rules of complying with flight safety. Thus it happens that pilots advance quickly, but the actual level of their training remains low. We still encounter

cases where one pilot is being taught by several instructors. This faulty practice must be curbed promptly by the appropriate commanders and political workers, and the party organizations must fight it in principled fashion as well.

An analysis of such cases permits the conclusion that their causes lie in inadequacies in the methodological training of instructors and in their insufficient qualifications as teachers. This is why selection of instructors and improvement of their training are now acquiring exceptionally important, if not decisive, significance. Here, I believe, there is a broad field for the activity of the political organs and party organizations of all air units and subunits. Constant party concern for the ideological, professional and methodological growth of instructors is concern for the quality of pilot skills, and consequently for flight safety.

Examining the complex of highly intricate and responsible tasks of commanders, political workers and party organizations in connection with making flight crews combat ready, we cannot fail to turn attention to the following circumstance: Beginning with the first days of his work in a new collective the young pilot shows great attention to experienced colleagues, commanders and specialists, and tries to imitate them in all things. And the viewpoints the airmen develop in relation to accident-free flying depend in many ways on the strictness of the order established in the unit, on the situation that has evolved in the collective, on the size of the influence exerted here by commanders and on how well party-political work is organized.

Disregard of this circumstance cannot but raise alarm. In fact, it is difficult to nurture a young pilot's respect for complying with the laws of flying if these laws are violated before his eyes. For example, one squadron planned flight training for young pilots in adverse weather with instructors who had experienced considerable interruptions in their flying. Such violations of the instruction methods do serious harm not only to the quality of occupational training but also to indoctrination of the new generation of airmen.

The airplane and the helicopter are collective weapons. It is well known that the operational reliability of such a weapon depends directly upon the experience, the ability and the quality of the work of engineers and technicians. Specialists of the air engineer service invest a great deal of labor, creativity and wit into preparing for each sortie. However, sometimes experience acquired in difficult conditions is not made known beyond a relatively narrow circle of people. We need to make mention of persons who distinguish themselves in flying, and reward and publicize the proficiency of airmen who had prevented equipment failure. The arsenal of party-political work contains a great diversity of forms and methods for this purpose. A proposal made by communists of a certain air squadron at a party meeting deserves attention: They suggested recording every act of prevention of a flying accident in the flight log of pilots and in a special personal log of technicians. We should also remember that individual work with engineers, technicians and junior aviation specialists is most important in achieving the required impact in instilling a sense of personal responsibility for the quality with which aviation equipment is prepared.

Problems associated with the moral, psychological and physical tempering of military airmen also require the most persistent attention from commanders, political workers and party organizations. When intercepting, bombing, conducting reconnaissance or attacking, the pilot must perform in the presence of a rigid time limit. This requires him to exert considerable spiritual and physical effort, to react quickly and accurately and to orient himself instantaneously in the aerial situation. Moreover complex situations associated with weather conditions or failure of some instrument or machine unit may also arise in flight.

Only he who is fully proficient with the equipment and who is characterized by firm will, good self-control and discipline in all respects is capable of surmounting difficulties and fulfilling a mission under such conditions. A pilot without these qualities would lose control on finding himself in a complex situation. His reaction to conditions that could lead to an accident in the air would be slow, and his actions would be incompetent.

Flight personnel acquire abilities, habits and high moral, combat and psychological qualities not right away but in the course of purposeful training and indoctrination in classrooms, at the airfield, during flying and in tactical flight exercises. Experience shows that commanders, political workers and party organizations who develop the ideological and occupational maturity of pilots, navigators, engineers and technicians and improve their moral and psychological maturity in the course of combat and political training achieve stable successes in ensuring accident-free flying.

The fact that pilots act confidently in a complex situation and make competent decisions in the air is to a great extent the product of the example given by the flying political worker. As a rule he has a complete knowledge of the aviation equipment and armament, he flies shoulder to shoulder with comrades aboard modern aircraft, and he competently combines the difficult profession of flying with party activity. High morality, a moral example in behavior, unity of word and deed, outstanding flight proficiency, and simplicity and modesty in communication with people, when combined with adherence to principles and exactingness, have earned many political workers indisputable authority among the personnel.

However, the effectiveness of party-political work aimed at ensuring flight safety is predetermined not only by its competent organization by political organs, political workers and active party members but also by how much objective interest is displayed in it by unit and subunit commanders. Life persuasively shows that wherever commanders rely on party organizations daily and are able to competently direct their activities toward preventing flight accidents and reinforcing flight discipline, high results are invariably attained.

Questions of flight safety must be constantly in the center of attention of political organs, the communists of which have rich experience, are capable of analyzing shortcomings quickly and can offer practical qualified assistance locally.

Communists of the safety service, who are obligated to achieve total exclusion of accidents, play a special role in ensuring strict compliance with the laws

of flying. Solving the problems of flight reliability would be unimaginable without the active participation of communists of the rear services, communications, and the formation and unit sections and services. The activities of higher military air schools are acquiring increasingly greater significance in this aspect. To upgrade the quality of instruction in academies and in institutions of higher education means to sharply raise the level of flight safety.

It stands to reason that communists of the General Staff, the directorates and the central apparatus of the air force commander in chief have the dominant role in eliminating the preconditions for accidents in air force subunits and units.

The first weeks of summer combat training are behind. The successes are becoming more and more distinct, but there are disappointing failures as well. Unit and subunit communists who deeply and comprehensively analyze the positive experience and the shortcomings of party-political work aimed at mobilizing the personnel for accident-free flying are doing the right thing.

Crash campaigns cannot be tolerated in the struggle of party organizations for flight safety and for high combat readiness. This work must be constantly in the center of attention of every commander, political worker, staff officer, air engineer service specialist and the maintenance subunit. As was validly emphasized at the Sixth All-Army Conference of Primary Party Organization Secretaries, political organs and party organizations are called upon to instill intolerance toward shortcomings in communists and fight for effective preventive measures, so that high exactingness and organization would become the rule of life of all military collectives.

Indoctrination of military airmen in the spirit of precise compliance with the rules of flight service is a hard job, one requiring great persistence and purposefulness, a creative approach, and initiative. In order that a desire to fulfill the requirements of documents regulating flight service and to comply strictly with flight discipline could be formed successfully in every soldier, we need to make use of all resources at the disposal of commanders, political workers, and party and Komsomol organizations.

The decisions of the 26th CPSU Congress clearly defined the tasks and ways of further improvement of the methods of party work. It is the priority duty of political organs and party organizations to make each communist an active promoter of the implementation of its decisions in the jubilee year, and to promote reinforcement of party influence on forming high moral-political and combat qualities in the military airmen on this basis. It is only on this condition that a task of state importance--flying reliably, flying without accidents--can be fulfilled completely, that the combat readiness of the units and subunits will grow, and that the personnel will honorably meet the national holiday of the 60th anniversary of the USSR's formation.

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## AIR FORCES

### OPERATIONS OF AIRCRAFT AGAINST SHIPS AT SEA DISCUSSED

Moscow MORSKOY SBORNIK in Russian No 3, Mar 62 pp 37-43

[Article by Lt Col (Ret) I. I. Kolosov: "Operations of Aircraft Against Ships at Sea Under Conditions of Electronic Countermeasures"]

[Text] Judging from statements made by military experts of various capitalist states, air operations against ships in the situation today will involve the need to penetrate a powerful and deeply echeloned air defense system, the backbone of which is comprised of missiles and various radioelectronic equipment. The role of a new and constantly developing type of support for air combat operations, electronic countermeasures, is therefore increasing at a tremendous rate.

The objective of electronic countermeasures is that of disrupting or complicating the functioning of radioelectronic equipment, which results in disorganization of control over antiaircraft personnel and equipment, reduction and in certain cases, even neutralization, of their combat capability and the creation of conditions conducive to the aircrafts' successful employment of their own weapons. If the functioning of radar stations on board ships is effectively prevented, for example, the ships will be unable to detect air targets or to direct antiaircraft missiles, fighters or artillery fire and consequently, will not be in a position to counteract raids by assault aircraft. By disrupting the radio communications of ships or by creating the right kind of interference, it is possible to disrupt control over forces repelling air strikes and prevent fighters from using the sights for firing their weapons.

It is perfectly clear that the enemy will also be employing radio countermeasures, in order to disrupt the functioning of radio navigation systems on aircraft in a grouping delivering a strike against ships, to complicate control of aircraft operations and to prevent their employment of a prearranged procedure for firing the various combat weapons by means of sights and in some cases, to make it impossible for the aircraft to even reach their targets. In the opinion of many foreign experts, disrupting the functioning of shipborne radioelectronic means of detection and especially, the jamming of that equipment by means of which antiaircraft missiles and various guided projectiles are guided to the targets, is therefore taking prime importance in the support of air combat operations.

The military press of various foreign countries have repeatedly carried articles about the fact that the destruction primarily of special air defense ships and radar surveillance aircraft and the extensive employment of electronic countermeasures from aircraft in the combat formations, as well as the large-scale employment of radar camouflage measures on flights are the most important factors in the use of aircraft against ships in the modern situation.

Using information taken from the foreign press, let us take a look at what kinds of equipment and methods may, in the opinion of foreign military experts, be used for disrupting the functioning of radioelectronic equipment during air operations against ships at sea. First of all, let us point out that electronic countermeasures as an active form of warfare between opponents are, in the opinion of most military experts of the capitalist states, the main and most effective means of disturbing the mode of operation of radioelectronic equipment tracking a target and guiding the appropriate forces and equipment to it.

In general, it is believed that the organization of successful electronic countermeasures against the enemy mainly involves the creation of radio interference. Incidentally, it would be appropriate at this point to mention in passing that radio interference ordinarily means deliberately created electromagnetic oscillations, which distort useful signals or make it difficult to receive and observe them on radar screens. The radio interference can be active or passive. Both types of interference affect the receivers of the radioelectronic equipment to be suppressed and also their terminal devices: displays, recording equipment and automation systems.

Active interference is subdivided by width of the emission frequency spectrum into spot jamming (designed to neutralize one or several sets operating on a single, fixed frequency) and barrage jamming (designed to disrupt the functioning simultaneously of several radar sets operating on various wavelengths, or a single set capable of retuning within a certain wave band).

It should be mentioned that the great effectiveness of jamming results from the existence of a number of weak points in radioelectronic equipment. Bearings can be taken on radar sets operating on board a ship, for example, and at distances considerably exceeding the range at which aircraft can be detected in the air.

An important shortcoming of radar sets lies in the fact that they are incapable of distinguishing between an actual target and a false one. It is precisely for this reason that radar confusion deflectors are used as part of flight support for aircraft engaged in combat operations in naval theaters.

We know from the military press of foreign states that research is presently being intensely conducted to make the radioelectronic equipment of ships, aircraft and so forth more resistant to jamming. Regardless of the degree of success achieved in weakening the effect of radio countermeasures, however, experts abroad believe that jamming will retain its dominant role in the disorganization of control over both aggressive and defensive personnel and equipment. Judging from information published in the foreign military press, this viewpoint is based on experience

from World War II and on the established rule that the achievements of science and technology are ordinarily applied in the radioelectronic equipment of ships and aircraft and in the creation of radio jamming equipment, to an equal degree (although not always simultaneously).

We know, for example, that in World War II the British were able to organize radio countermeasures against Hitlerite aircraft utilizing the Lorentz navigation system, as a result of which the Germans were forced to change aircraft navigation systems three times in less than 2 years. The Germans themselves achieved similar success in disrupting the functioning of the British "G" hyperbolic radio navigation system.

With respect to the employment of aircraft against ships at sea in a situation with electronic countermeasures, it would be appropriate to stress that viewpoint held by the military experts of a number of nations, whereby the very fact of generating interference not only disrupts the mode of operation of radioelectronic equipment, but also creates stress in the combat situation, since it becomes necessary for the crews of ships and aircraft to receive additional, special training.

Without a knowledge of essential data characterizing the effectiveness of countermeasures by active and passive jamming equipment against the functioning of various radioelectronic systems and devices, it is difficult to think of all the elements which will make the employment of aircraft weapons against ships more difficult or easier. In the opinion of certain foreign military experts, however, jamming makes it considerably more difficult for fighters to carry out attacks against aircraft engaged in a strike and complicates and in some cases, disrupts, the guidance of antiaircraft missiles and the firing of antiaircraft artillery by means of sights.

Certain experts in the technologically advanced nations, however, believe that it would be a mistake to say that electronic countermeasures can totally paralyze the functioning of all the radioelectronic equipment in a formation of ships for a relatively long period of time. Articles in the foreign press, for example frequently express the opinion that when jamming is organized it is expedient to consider the ranges of early-warning radar and radar for guiding fighters and controlling the fire of antiaircraft artillery and missiles. It follows from this, in the opinion of American naval personnel, that it will be more advantageous to use aircraft employing guided weapons than to use bombers in air operations against ships. In this case there is no need to employ countermeasures against the numerous means of control of antiaircraft artillery fire and missiles. In other words, they feel that in such a case all the electronic countermeasures employed by the aircraft will concentrate on disrupting the early detection of fighters and frustrating their attacks.

Let us discuss this in greater detail. First of all, let us point out that according to statements made abroad, radar is the main means of early detection of air targets. Radioelectronic reconnaissance is essential to successfully counter these means. The World War II experience and postwar exercises conducted in the armed forces of the capitalist states are used to confirm this.



And so, it is believed in the armies and navies of various states that electronic countermeasures against aircraft should be coordinated with radioelectronic reconnaissance, which is capable of revealing the basic data pertaining to modes of operation of the shipboard radar sets and, to the extent that this is possible, of determining what radioelectronic devices are being employed for guiding fighters and during the use of antiaircraft missiles and artillery.

One of the main tasks of radioelectronic reconnaissance is considered to be that of providing accurate information about the operating frequencies of radar sets and about their ranges. The greater the accuracy of this information, the more effective can be the use of transmitters of active interference and of passive jamming equipment.

It would be appropriate at this point to point out the fact that airborne radioelectronic reconnaissance is preferred by foreign military experts over any other in the entire group of radioelectronic reconnaissance forces and facilities. This is attributed to the fact that the scanning beam of shipborne aircraft detection radar sets is most frequently pointed upward and therefore does not go relatively far outside the area in which the ships are located at a given time. What is more, ships try to remain as little as possible in areas in which coastal facilities can conduct radioelectronic reconnaissance, or they attempt to limit the use of radar during such a time.

None of what we have said, of course, relates to the coastal radioelectronic reconnaissance of ships (and consequently, the locations of radar sets) involving the use of information obtained from radio communications.

The air forces of a number of technologically advanced states ordinarily have various kinds of equipment (receiving equipment, analyzing devices and so forth), which determine the basic tactical and technical data from detected radar sets for conducting radioelectronic reconnaissance.

Judging from information contained in the foreign press, airborne radio reconnaissance sets can pinpoint the functioning of shipborne radar at distances exceeding the radar range. It is perfectly clear that this permits reconnaissance aircraft to conduct reconnaissance (or at least to gain it) before they are detected by the shipborne radar.

We should probably point out, however, the fact that there is a certain difficulty involved in the use of airborne radioelectronic reconnaissance sets in areas near the shore. A difficulty would obviously be created for airborne radioelectronic reconnaissance in such a case by the simultaneous operation of coastal radar facilities, which are aligned with the shipborne radar sets and operate on similar frequencies.

Finally, there is the fact that there are peculiarities involved in the employment of airborne radioelectronic reconnaissance created by the need simultaneously to observe the functioning of radar facilities over a broad frequency band. And this means that probably only a group of aircraft operating simultaneously at various

altitudes and flying in various directions would be capable of disclosing the entire system of radioelectronic equipment used on the ships against which the assault aircraft are operating.

Since we are discussing the use of aircraft against ships at sea, it would be a good thing to say a special word about electronic countermeasures against fighter attacks, since great importance is attached to this in the navies of a number of states. It would be a good thing at this point to point out the fact that certain foreign experts believe the fighter aviation to be the most effective air defense force for formations of ships during the repelling of raids by assault aircraft. In their opinion the fighter-interceptors, which carry special radar sets making it possible to use sights for firing various types of weapons in bad weather conditions and at night, are the only force capable of repelling attacks upon ships before the assault aircraft are close enough to employ their own weapons.

At the same time, it is not difficult to see that it is extremely difficult for a fighter pilot to use his radar in a situation involving electronic countermeasures, since both active and passive interference greatly impair radar visibility.

Radar sets which do not have devices to protect them against passive interference frequently provide absolutely no possibility for the fighter to detect the target and especially, to attack it. If we take into account the fact that most radar sets installed on fighters, judging from information published in the foreign press, lack an effective defense against passive interference, the combat capabilities of fighter aircraft in the air defenses of a formation of ships in a situation involving electronic countermeasures also become perfectly apparent. Added to this is the fact that certain types of missiles used in aerial combat are guided to the target by means of an active or semiactive guidance system are also greatly affected by electronic countermeasures. These weapons include, as an example, the Falcon-1 and Falcon-1D guided missiles, which are carried by the F-894, F-101B and F-102A fighters.

In order to guide these missiles to the target, the fighter must irradiate the target with its own set designed for intercepting targets and sighting on them. Approximately the same method is used for guiding the Fireflash and Nord-103 rocket projectiles to the target.

As a graphic illustration of the role of electronic countermeasures for repelling air strikes let us discuss in most general terms the process used in the capitalist armies for guiding fighters to heavy aircraft.

Let us point out, first of all, that an absolute majority of foreign experts believe that it is presently impossible (or almost impossible) to conceal from ships aircraft flying in the area of those ships, since the modern radioelectronic equipment installed on ships and radar surveillance aircraft can detect air targets essentially at any altitude. In other words, air targets can be tracked continuously (although it is unquestionably possible for the targets to be lost completely, due to jamming).

When they guide fighters to the enemy the ships, through coordinated action, lead them to an area in which the radar installed on the fighters make it possible to detect the target and carry out the attack.

And so, the entire detection system takes part to some degree in the initial guidance of the fighters, whereas during the attack they use only the airborne radar by means of which firing with sights is conducted.

Judging from statements published in the foreign military literature, it is essential to have completely satisfactory radar visibility of the target, making it possible to observe the target on the fighter's sighting radarscopes, in order to guide the missile to the target.

Based on the principles underlying the functioning of intercept radar sets and the general characteristics of radar deflectors, it is believed that aircraft using the deflectors are capable of simulating any combat formation, thereby creating advantageous conditions for themselves. In such a case warning devices on the fighter's guidance set will emit false signals and prevent the missiles from being guided to the target.

The crew of an aircraft, by using enough deflectors to produce a large equivalent deflection area and also by taking evasive action against fighters, can create a situation for the fighter, in which it is either extremely difficult or absolutely impossible to track the target during the attack.

The effectiveness of an attack is also reduced when the assault aircraft fly in the zone in which the radar deflectors are functioning. This is due to the fact that even after it detects the target, the fighter is not in a position to approach to within the range in which the automatic lock-on and tracking of the target is possible. Because of this the attack is drawn out and ultimately aborted.

In addition to all the above, one also needs to bear in mind the role of morale: When it is impossible to distinguish the actual target among the false ones, the pilot, out of fear of colliding with the aircraft which he is attacking, may decide to pull out of the attack.

And so, the military experts believe that jamming is an effective means of combating fighters, since it prevents the ships to guide covering aircraft to the assault aircraft and, most importantly, it makes it impossible for them to use guided weapons. The greater the density of the aircraft making the attack, the greater the difficulties created for the fighters by the jamming.

We have already said that electronic countermeasures are not limited to the creation of interference against the functioning of air target detection radar carried on board ships and aircraft. In the opinion of military experts in the capitalist nations interference will also be created against radar sets which are a part of the fire control systems of antiaircraft artillery and antiaircraft guided missiles.

The article has also underscored the fact that, in the opinion of the foreign experts, electronic countermeasures against the fire control sets for antiaircraft artillery and antiaircraft guided missiles of ships, as well as against radio-electronic devices on the missiles themselves, are not as effective as the jamming of the shipborne and airborne radar sets.

Despite this, we feel that it would be appropriate to discuss, even very briefly, matters related to electronic countermeasures influencing the effectiveness of fire from shipborne antiaircraft artillery and antiaircraft guided missiles.

In the opinion of foreign experts, assault aircraft groups will also have to waste considerable effort for suppressing antiaircraft guided missiles and antiaircraft artillery as they overcome the effects of shipborne air defense forces and means. Among other things, they will need a corresponding number of aircraft (and not a very small one, from all appearances) with special equipment for creating active and passive interference. We refer to the provision of direct cover for the combat formations of assault groups for purposes of camouflaging their flight, beginning when they come within range of the shipborne antiaircraft guided missiles and artillery.

In order to discuss more systematically how, in the opinion of foreign authors, electronic countermeasures should be conducted against shipborne antiaircraft guided missile and artillery systems, we must first say a few words about the principles underlying the employment of antiaircraft guided weapons.

According to information published in the British press, for example, a Seaslug missile is fired by means of shipborne early warning radar. This radar set initially determines the coordinates of the attacking aircraft, and then their course and flight speed.

The launcher is aimed on the basis of this information (and the homing head is tuned to a different frequency).

When the target approaches to within range of the missile, an automatic computer issues the command to launch. Other types of shipborne missiles are used in a similar manner.

Based upon this and taking into account the great discriminating capability of modern radar sets designed for tracking targets, some foreign experts believe that the creation of a zone of radar deflection activity is one of the effective methods of covering combat formations of aircraft within range of antiaircraft guided missiles and conventional artillery. Furthermore, they believe that it is expedient for the width (along the front) and the height of this zone to be adequate to cover the combat formation of the aircraft.

Judging from information published in the foreign press, certain types of dipole deflectors dropped from medium altitudes produce passive interference for 50 to 90 minutes. Naturally, this time is reduced when the deflectors are dropped from lower altitudes, ranging between 10 and 30 minutes when dropped at low altitudes.

It should also be borne in mind that when there is great wind velocity or considerable turbulence, the effectiveness of passive interference is increased due to the powerful dispersal of the deflectors.

When it is necessary for the aircraft to penetrate through a zone within range of shipborne antiaircraft artillery, the task of carrying out electronic countermeasures, the foreign experts believe, will consist in using interference to disrupt fire control and to complicate the conduct of automatic fire using sights. Incidentally, it should be pointed out here that the sets of radioelectronic fire control for antiaircraft artillery ordinarily consists of air observation radar and fire control radar sets. The air observation radar sets operate with a relatively broad beam, making it possible to detect and identify targets and to determine their coordinates.

The fire control radar sets receive the initial data from the detection radar, and the appropriate parameters essential to the firing are figured out on the basis of this data. Therefore, if observation of the target deteriorates drastically (due to passive interference, for example), automatic firing will be halted immediately.

I would point out in conclusion that, in the opinion of aviation experts of various countries, the use of interference during operations against ships at sea considerably weakens the counteraction of air defense forces and means. For the same reason, they feel that effective electronic countermeasures against ships at night leads to greater success for air strikes, since it is impossible in this case for the ships to conduct aimed defensive fire by means of optical instruments.

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## AIR FORCES

### LOCATING SHIPS AT SEA BY AIRCRAFT CREWS

Moscow MORSKOY SBORNIK in Russian No 8, Aug 62 pp 57-64

[Article by Col P. N. Yarushev, military navigator 1st class: "Methods of Increasing the Accuracy of the Determination by an Aircraft Crew of the Location of Ships at Sea"]

[Text] We know that when determining the location of ships at sea an aircraft crew first finds the latitude and longitude of their own location, then determines the ships' position relative to the aircraft and finally, using this information, takes the geographic coordinates for the ships' location from a map. The navigator uses air navigation data for finding the latitude and longitude of the aircraft's location at the moment the ships' position is determined. The ships' position relative to the aircraft is ordinarily measured by the course angle (or azimuth) and the distance to them, most frequently using a radar site for this purpose, which provides adequate observation accuracy regardless of actual visibility.

The reliability of the geographic coordinates for the ships' position is therefore determined by the accuracy with which the aircraft crew determines its position and by the errors made in measuring the course angle and distance to the ships.

In order to determine the effect of the errors mentioned upon the accuracy with which the ships' location is determined and to establish their specific importance in the combined error, one must use a formula for calculating the quadratic mean error in the ships' location:

$$\sigma_{ls} = \sqrt{\sigma_{la}^2 + \sigma_{ps}^2}, \quad (1)$$

where  $\sigma_{ls}$ ,  $\sigma_{la}$ ,  $\sigma_{ps}$  represent the quadratic mean errors in the determination respectively of the positions of the locations of the ships and the aircraft and ships' position relative to the aircraft.

It is apparent from the formula (1) that the quadratic mean error in the determination of the ships' location depends upon navigational resources.

On long flights over the ocean one of the main air navigation methods ordinarily consists in reckoning the route by means of so-called general technical means making it possible to derive the coordinates for the aircraft's location with a deviation of 3-7 percent from the route flown, which is read from the last coastal reference point.

Accuracy can be increased in determining the aircraft's location (or what amounts to the same thing--error  $\sigma_{1a}^2$  can be reduced) by making extensive use of airborne electronic and astronomical means, and (it is very important to stress this) by constantly determining the wind movement on the basis of data obtained by means of isobaric measurements. In order to judge just how important it is to systematically determine wind speed and direction the fact should be mentioned that if wind speed changes by 24-56 kilometers per hour while the aircraft flies one hour at a speed of 800 kilometers per hour, this will result in a deviation of 3-7 percent from the prescribed route (given strict adherence to the conditions calculated in advance). And wind speeds change even more significantly at high altitudes.

For determining the position of ships relative to aircraft one must take into account the fact that the quadratic mean error  $\sigma_{ps}$  depends upon the quadratic mean error in the distance measurement and the quadratic mean error in the azimuth measurement. It can therefore be calculated using the formula:

$$\sigma_{ps} = D \sqrt{\left(\frac{\Delta D}{D}\right)^2 + (\Delta Az)^2}, \quad (2)$$

where D represents the actual distance between the ships and the aircraft at the moment the navigational measurements of the appropriate factors are made;  
 $\Delta D$ --the quadratic mean error in the measurement of the distance between the ships and the aircraft;  
 $\Delta Az$ --the quadratic mean error in the azimuth measurement.

It can be seen from Table 1 that the specific importance of error in determining ships' position relative to an aircraft ( $\sigma_{ps}$ ) reaches significant magnitude as the ships move up to 400 kilometers away from shore. The specific importance of error increases sharply with a reduction in this distance, but slowly decreases as the distance is increased. Consequently, under today's conditions, accuracy in determining the location of ships no more than 500 kilometers away from shore depends mainly upon the accuracy with which the ships' position relative to the aircraft is determined. At the same time, on flights over the open sea, accuracy in determining the location of ships depends mainly upon air navigation accuracy.

Table 1

Specific Importance of Quadratic Mean Errors  
In Determining the Position of Ships Relative to the Aircraft

Distance of ships from shore, kilometers	Specific importance of errors (in percentage) among other errors in determining the loca- tion of ships at sea
100	64
200	32
300	16.5
400	10.0
500	6.6
600	4.7
700	3.5
800	2.7
900	2.2
1000	1.7

Since accuracy in determining a ship's position depends upon the accuracy with which their azimuth and the distance to them are determined by means of a radar sight, let us briefly discuss how it should be prepared for a flight and how it should be used in the air. First of all let us say that the sight must be calibrated prior to departure, that is, the appropriate markers must be placed at the zero settings and the true figures for the range scales must be determined. Failure to do this will mean that an error committed in the measurement of slant range will become even greater when converted to horizontal range, which is plotted on a map by the navigator in order to determine the ship's position.

Slant range measured with an error of 2 kilometers, for example, would result in an error of 4 kilometers in horizontal range at a sighting angle of 30 degrees, 3.2 kilometers at a sighting angle of 40 degrees and 2.6 kilometers at a sighting angle of 50 degrees (the error is reduced as sighting angles become larger). The slant range to ships must therefore be measured especially carefully with sighting angles of less than 50 degrees.

If the slant range measurement is not converted to horizontal range, there is an additional error in the determination of the ship's position. This is due to the fact that slant range is always greater than horizontal range, that is:

$$R_h = \sqrt{R_s^2 - A^2}, \quad (3)$$

where A is the aircraft's flight altitude.



It is apparent from Table 2 (which gives the values for slant and horizontal ranges measured at a flight altitude of 10,000 meters) that the slant range measurement must be converted to horizontal range in order to determine a ship's position with greater accuracy.

Table 2

Correlations Between Slant and Horizontal Ranges  
Measured at a Flight Altitude of 10,000 Meters

Slant range (kilometers)	Horizontal range (kilometers)	Difference between ranges (kilometers)
20	17.3	2.7
30	28.3	1.7
40	38.7	1.3
50	48.9	1.1
60	59.2	0.8

The azimuth (course angle) for ships must also be measured by superimposing the sighted mark on the radar sight indicator upon the precise point of the target's image.

The conversion of course angle into azimuth or the adjustment of the sight indicator's azimuthal ring must always make allowances for the compass (deviations, magnetic deflections). Failure to take these adjustment into account will result in additional errors in the course angle, equal in magnitude to the adjustments not taken into account. This will ultimately result in erroneous determination of a ship's location on the map and consequently, in an error in its geographic position coordinates.

The precision with which the aircraft maintains its flight conditions also affects the accuracy with which a ship's location is measured.

At the moment the parameters for the ship's location are measured, the pilot must fly the aircraft especially strictly with respect to course, speed and altitude to avoid creating problems for the navigator, problems entailing additional errors in the measurement of range and course angle.

The auto pilot on board the aircraft must be used for flying it to make it easier for the crew to work while they are determining the location of ships.

One of the common errors made by navigators is that determining the aircraft's position from coastal reference points, which subsequently leads to error in determining a ship's position by the so-called reverse plotting method. When the navigator is not concentrating adequately he may commit an error and incorrectly

enter on the map (especially a small-scale map) the reference point from which he determines the aircraft's position.

Furthermore, it is quite frequently difficult to select for purposes of measurement a specific coastal reference point from its radar image on the sight screen, since this image does not always correspond to its configuration on the map (because of the small scale) or to its actual outlines.

Carefully preliminary preparation of the map must be made, primarily the isolation of typical radar reference points (datums), in order to reduce the degree of error in determining the aircraft's position from a coastal reference point.

It is easiest to select such reference points from photographs of a radar depiction of the terrain, from vertical photographs of the terrain and large-scale maps.

The number of reference points required will depend upon the degree of radar contrast of the specific area of terrain and upon the tactical and technical data for the sights to be used for observing them. Furthermore, one must also take into account changes in the configuration of the coastline due to ice or to tidal conditions.

The average distance between reference points should be no more than 50-100 kilometers. This will permit the navigator to determine the aircraft's position from one or two reference points plotted on his map and within detection range by means of the radar sight.

Let us now take a look at errors which can be made when determining the geographic coordinates of a ship's position on a map.

The navigator uses a protractor and a ruler for plotting on the map the parameters measured for a ship's position relative to the aircraft. He then takes the geographic coordinates for the ship's position by means of the map's reference grid. In the process errors may be made in plotting the ship's position with respect to azimuth and range, as well as in taking down the target's geographic coordinates. In addition, it is sometimes difficult to work with the plotting instrument.

When a flight map with a scale of 1:2,000,000 is used, 1 millimeter errors can be expected in plotting the range. This is the equivalent of 2 kilometers on the terrain. An error of 1 degree is possible in the plotting of azimuth. Errors reach as much as 2 degrees in the determination of latitude (or longitude).

The quadratic mean error in the plotting and the reading of geographic coordinates for a ship's position can be determined using the formula:

$$\sigma_{p1} = \sqrt{\Delta R^2 + \Delta Az^2 + \Delta L^2 + \Delta R_1^2}. \quad (4)$$

Given the above primary errors, a latitude of 40 degrees for the ship's position and a detection range of 100 kilometers, the quadratic mean plotting error will equal 5.3 kilometers.

The following method, which does not require plotting on a map, can be recommended for simplifying the navigator's work and speeding up the process of deriving the geographic coordinates for a ship's position.

This method is based on the possibility of finding the latitude and longitude of a ship's position from the known geographic coordinates for the aircraft's position and from the parameters for the ship's location, using the current relation between these values (Figure 1). That is:

$$L_s = L_a + \Delta L = L_a \pm R \cos Az, \quad (5)$$

$$R_s = R_a \pm \Delta R = R_a \pm \frac{R \sin Az}{\cos L_m}, \quad (6)$$

where  $L_s$  is the latitude for the point at which the ship is located;

$L_a$ --the latitude for the aircraft's position;

$R_s$ --the longitude for the ship's position;

$R_a$ --the longitude for the aircraft's position.

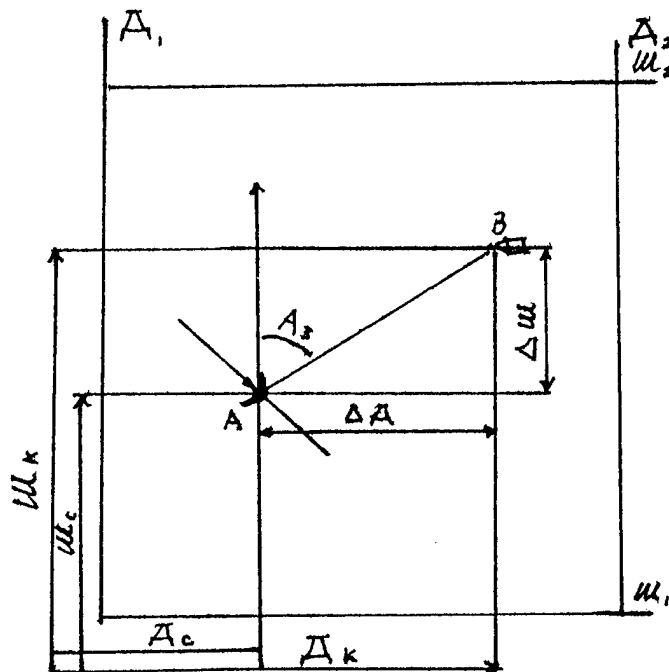


Fig. 1

[Key on following page]

$\lambda$  = R (longitude)  
 $\psi$  = L (latitude)  
 k = s (ship)  
 c = a (aircraft)

Formulas (5) and (6) can be used for compiling special tables, charts or calculators for determining the geographic coordinates for a ship's position from the geographic coordinates for the aircraft's position, the azimuth and range of the ship and possible latitudes for its position. The task can also be performed by means of a navigation slide rule.

Using this method the coordinates for the aircraft's position can be determined in advance, while the situation is still calm, before reaching the target area, and entered on a map for specific points in time (with 2- to 3-minute intervals).

Following detection of the target the parameters for the ship's location are measured at the designated point in time.

Finally, let us make a few comments about reverse plotting, since some navigators still have incorrect ideas about this and navigational errors arise as a result. A crew sometimes basis all the flight calculations on information contained in a weather report received on land, at best only gathering more specific data on the wind while flying along the coastline.

After detecting the ships the navigator effects navigation so as to reach a coastal reference point, also without altering allowances for the wind. Upon reaching the coastal reference point the navigator uses the deviation between the aircraft's actual position and the calculated point for reaching the reference point for precisely determining his route and the position of the ships by means of reverse plotting.

The navigator does not use ground aids to navigation or make flight adjustments throughout the entire flight, considering that navigational errors will in any case be revealed upon reaching the coastline and it is far more rapid and simple to perform the reverse plotting from "direct" courses.

The unacceptability of navigating by this sort of passive, if I may, flight methods is obvious. While it has made it possible to some degree satisfactorily to perform the task of determining the position of a target located not far from the coastline (given a small likelihood of a drastic change in the wind along the route), it is clearly unacceptable to use this method on lengthy flights over the ocean.

Flight conditions over the ocean, during a long separation from the coastline, can change drastically. There have actually been cases, for example, in which the direction and velocity of the wind changed two or three times at a distance of 800-1000 kilometers from the coastline. This ordinarily occurred when passing through pressure systems.

If, during an entire flight in such conditions, the navigator does not change his initial computations but flies the aircraft according to the old wind data and does not pinpoint the aircraft's position by various means and methods, this results in expensive deviations from the prescribed route or even failure to reach the search area, that is, failure to accomplish the entire aerial reconnaissance mission. Let us use some examples to explain this. The crew has been assigned a flight route from point A to point B and back, for example (Figure 2). To simplify matters we will not take into account the aircraft's turn radius and will take the wind vectors from the average wind magnitude at the boundaries. The navigator has made the flight calculations from point A to point B and back from the wind data given in the weather report. Since the wind prediction has proven correct for the first segment of the route--that is, from point A to point B, the aircraft covers this segment without deviations. After that, from point B to point B, the wind vector changes (drops), which results in the aircraft's deviating to point E instead of the prescribed point B.

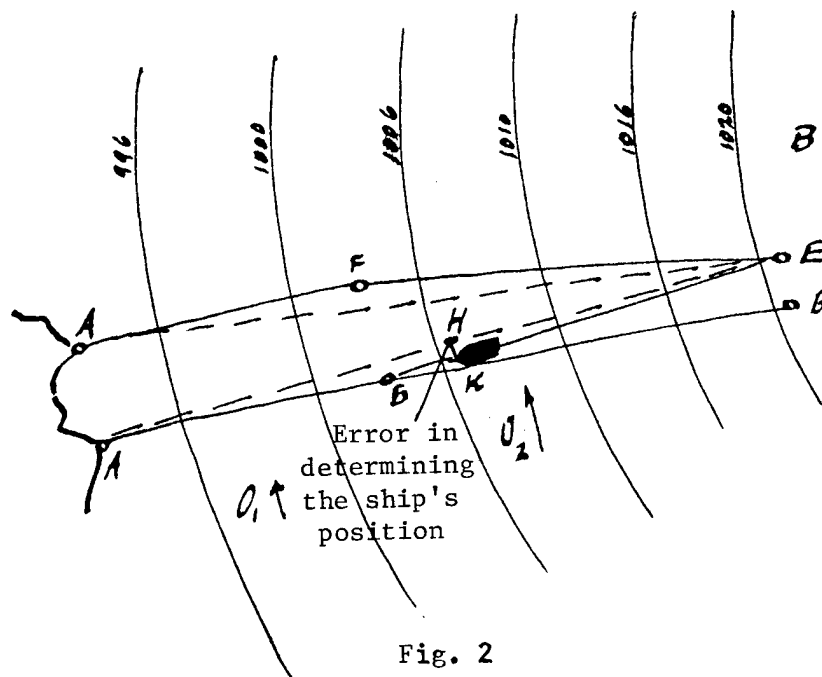


Fig. 2

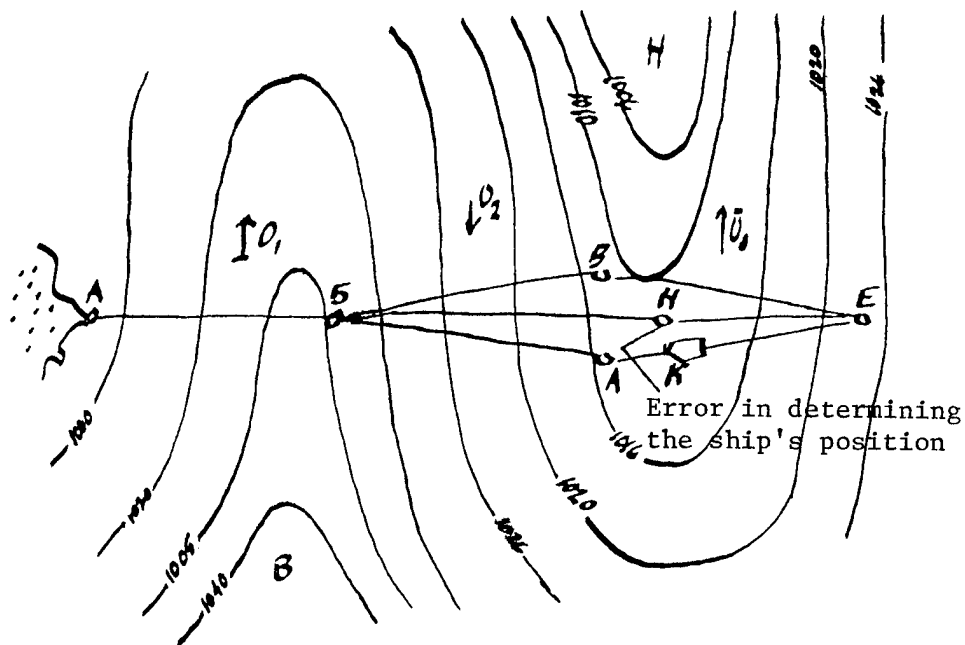
On the return trip the aircraft is affected by wind changes and ends up as a result at point  $A'$  instead of the prescribed point A.

Distance  $AA'$ , which equals the error, is, of course, called a flight discrepancy. It results from failure to take into account the wind vector on the route.

When he performs reverse plotting of the route from point  $A'$ , the navigator produces flight route  $AEH$ . He takes this as the true route, although the route has actually passed through points  $A \rightarrow E \rightarrow F \rightarrow A$ .

It is apparent from Figure 2 that if, upon detecting ships at point K, the navigator pinpoints their position by means of reverse plotting, that is, by transferring point K to point H, he thereby commits an error equal to KH in determining the position of the ships.

Let us consider one other example (Figure 3). Let us assume that the prescribed flight route runs from point A to point E and back. The flight calculations have been made from wind data given in a weather report.



Actual wind at the boundaries is the equivalent of  $\vec{U}_1, \vec{U}_2, \vec{U}_3$ . The flight route is not refined by means of reverse plotting, since the aircraft has reached point H without any deviations. That is, the discrepancy is zero.

Because of failure to take the wind vectors into account the aircraft has actually traveled route A  $\vec{B}$  A E  $\vec{B}$  A.

The error committed in determining the position of the ships detected at point K is the equivalent of segment KN.

We can see from the examples considered that error in determining the position of ships will depend upon the amount of time the aircraft has flown under conditions not corresponding to those used in the calculations--that is, under the effects of wind conditions not taken into account.

When the wind is not taken into proper account reverse plotting cannot reflect the actual flight route or pinpoint the position of the detected ships.

In order to increase accuracy in determining a target's position the crews of reconnaissance aircraft must, throughout the entire flight, make comprehensive use of all means at their disposal, measuring the drift angle especially carefully with the isobaric method (every 10 to 15 minutes while in the air), adjusting the aircraft's course on the basis of this data and making greater use of astronomical plotting methods.

There have also been instances in which extensive errors have been made in determining the position of ships due to failure to take into account the aircraft's speed while descending and especially, while climbing (with a variable flight profile).

Even when the wind is taken into proper account and the flight route has been accurately determined by means of reverse plotting, one can expect errors in determining the position of ships if the aircraft's air speed is not taken into account.

In order to increase accuracy in determining the position of ships when the reconnaissance aircraft changes altitudes in the search area, it is essential strictly to orient the beginning points for descending and climbing relative to the target of observation, and for the reconnaissance aircraft itself to observe definite horizontal and vertical speed conditions while maneuvering.

After reviewing possible errors in determining the position of ships, we can conclude the following are essential for increasing accuracy in the performance of this mission:

- to navigate on lengthy flights over the sea (or ocean) with the comprehensive employment of all available navigational means;

- to monitor the route during the entire flight and adjust flight conditions; for this one needs to measure the wind with the isobaric method and determine the line of the aircraft's position by astronomical and radiotechnical means;

to make thorough preparations and calibrate the radar sight for measuring the position parameters for the ship and the aircraft;

to have prepared flight maps, with reference points indicated for the measurements;

to use special tables on the flight for converting slant ranges into horizontal ranges and charts for determining the position coordinates for ships;

to perform vertical maneuvering according to a plan prepared in advance for descending and climbing.

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## AIR FORCES

### MODERN MEANS OF AIR NAVIGATION FOR FLIGHTS OVER WATER

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[Article, title as above, by Doctor of Technical Sciences Col G. F. Molokanov. Passages printed in boldface in source are set off in slantlines -- This article was written on the basis of material taken from open sources published by the Soviet and the foreign press.]

[Text] Our experience in the past two wars has shown that an armed conflict in the future will inevitably embrace vast sea and ocean theaters. This means that the aviation should be prepared for prolonged flights over the sea and involving the performance of a complex system of combat missions. Furthermore, flights over vast bodies of water, including the Arctic Ocean, will in many cases most likely have to be performed to the full operational radius of the aircraft and ordinarily, in difficult weather, day and night, while frequently penetrating a powerful and deeply echeloned air defense system.

In his speech at the 22d CPSU Congress, Marshal of the Soviet Union R. Ya. Malinovskiy, minister of defense, made the following statement: "The Central Committee's correct military-technological policy, the successes of our industry and the outstanding achievements of Soviet science and technology have permitted us to create within a relatively short time a powerful, qualitatively new materials and equipment base for arming the army and navy with modern military equipment, first and foremost, missile equipment."

The postwar development of aviation equipment has been marked by the transition to supersonic aircraft, by the rapid improvement of manned aircraft and the creation of unmanned and spacecraft, as well as by the development of new aircraft navigation and landing systems. In our nation and abroad a great deal of attention is devoted to the development of technical navigational means, since the effectiveness of air combat operations depends upon the accuracy with which aircraft adhere to the prescribed route, the correctness with which a crew determines its position, their successful arrival at the prescribed targets with respect to time and place, and the accurate destruction of the targets. Long-range flights over the sea, especially at low altitudes in clouds, far from the coastline, are the most difficult flights in the navigational sense. Under these conditions there is no possibility of getting one's bearings by the screen of the radar sight, it is frequently not possible to use stellar methods of determining the

aircraft's position because the heavenly bodies are not visible, and it is difficult to determine the navigational elements, especially on flights with a variable configuration. Important achievements in the fields of automation, remote control, radioelectronics, geophysics and other sciences and improved accuracy in the measurement of a number of physical variables have contributed to the development of qualitatively new navigational equipment based on the most diverse principles. In order correctly to assess the capabilities of contemporary and prospective navigational means, it is expedient to base their classification on the primary source of navigational information, because it primarily describes the general features of one group or another of technical navigational means. Terrestrial magnetism, the atmosphere, the earth's gravity, natural reference points, electromagnetic fields, the heavenly bodies, and so forth can be used as sources of navigational information. This list of sources of navigational information, so extensive and of such diverse nature, has brought about the diversity of modern technological means and methods of navigation. These can be divided up into individual groups, if we use the concept "field" extensively applied in many of the natural sciences. I would point out, incidentally, that there can be scale and vector fields simultaneously in the same area of space. For example, in a free atmosphere one can simultaneously deal with fields of temperature, pressure, wind, terrestrial gravity, magnetism, electromagnetic fields emitted by transmitting devices or the heavenly bodies, and so forth.

Basing the classification on the above listed fields, modern technical means of navigation by a primary source of navigational information can be subdivided into four basic groups.<sup>1</sup>

1. /Geotechnical navigational means/ are based on the measurement of various parameters of the Earth's natural (geophysical) fields.

This group of navigational means includes the following: magnetic compasses, aerial magnetometers, airspeed indicators, barometric altimeters, free-air thermometers, flight speed and altitude centrals (tsentrali), automatic aerial dead reckoning devices, inertial systems, gyroscopic navigational and piloting instruments, optical drift meters and other instruments.

Let us briefly discuss the principles underlying the functioning of the above instruments.<sup>2</sup>

1. This subdivision, like any classification in general, is to some degree hypothetical. We can therefore not rule out the development of technical means which can be classified, as an example, either as geotechnical or radiotechnical means, or as astronomical or radiotechnical means. In such cases, however, we can still outline the basic features of each group and of each new technical device, which makes it possible to correctly assess their navigational capabilities.
2. In describing the principles on which this or that instrument is based, the main attention is given to that with which the broad range of flight personnel is least familiar. More is therefore said about aerial magnetometers, gyroscopic instruments and the like than, for example, about magnetic compasses, airspeed indicators and so forth.

/Magnetic compasses/ are based on a principle well known to all, that of determining direction of the horizontal aspect of the Earth's magnetic field, from which the direction of an aircraft's flight (its magnetic course) is read.

/Aerial magnetometers/ are based on the measurement of the intensity of the Earth's magnetic field, which makes it possible, with an isodynamic chart (isodynamic lines are lines of equal intensities of the Earth's magnetic field) to determine the line for the aircraft's position or to perform the flight along isodynamic lines coinciding with the prescribed route. This requires compiling reliable charts of isodynamic lines for various areas and flight altitudes. The great accuracy with which the intensity of magnetic fields can be measured by means of a magnetometer has also made it possible to perform an extremely important task, that of detecting submerged submarines.

/Airspeed indicators, barometric altimeters, free-air thermometers, speed and altitude centrals/ are based on the aerometric principles involved in determining the parameters of the Earth's atmosphere, that is, on the measurement of meteorological fields of pressure and free-air temperature.

/Automatic aerial dead-reckoning devices/ operate from sensors, which use various of the Earth's geophysical fields for determining an aircraft's flight speed and course.

/Inertial systems (gyro orientators)/ measure and integrate the accelerations of an aircraft moving within the Earth's gravitational field. By measuring these accelerations on a horizontal plane from the moment of takeoff and integrating the measured speeds by means of an integrator, one can learn the aircraft's speed of movement relative to the Earth at any time.

By integrating the speeds determined by this method, it is not difficult to determine the path covered, and therefore, the aircraft's current coordinates as well.

Inertial systems are completely autonomous. They can be used not only for determining navigational elements and current coordinates, but also as a transmitter of signals for automatically controlling the aircraft's movement along a prescribed flight path.

/Gyroscopic navigational and piloting instruments/ (directional gyroscopes, gyroscopic compasses, gyro-horizons, vertical gyroscopes and so forth) which utilize the features of a gyroscope (conventional, floating, vibratory, molecular [also called corpuscular], kryogenic and so forth) to keep the position of one's axis steady (immobile relative to the stars) in inertial space. To make it possible to determine the aircraft's position relative to the Earth (course, bank, pitch and so forth) from the readings on these instruments, the circuits of the gyroscopic navigational devices ordinarily include sensitive elements which determine the local vertical, that is, the direction of the force of gravity, which is one characteristic of the Earth's field of gravity.

The functioning of /optical drift meters/ is based on the visual observation of the natural "field of terrestrial landmarks" and various points on the Earth's surface and the measurement of their coordinates relative to the aircraft (course angle, vertical and so forth). We know from the press that a number of countries are engaged in the development of various navigational systems which utilize as the primary source of navigational information the "field of terrestrial landmarks." These include automated systems based on the comparison of an image of the target or intermediate points on the route with information fed into the system's "memory" (the coordinates of the points, their course angles, ranges, areas, emission spectra and so forth).

A comparison of data stored in the system's "memory" with the actual information makes it possible to automatically control the aircraft's flight by means of the error signals, maintaining it on the prescribed path and assuring its arrival at the target. Natural landmarks (islands and characteristic configurations of the coastline) or artificial reference points (beacons) can be used during flights over the sea.

It is felt that geotechnical means of navigation (except for optical drift meters) can be employed with equal success in flights over land or over the sea. They make it possible to maintain the prescribed flight conditions (course, airspeed, relative altitude) and assure its arrival in the target area. On a flight over land with the Earth's surface in view it is possible to use these for measuring the navigational elements (drift angle, ground speed and wind). Geotechnical means of navigation, with periodic visibility of ground reference points or adjustment by other means, make it possible to determine the aircraft's current coordinates by automatic dead reckoning with the discreet input of wind factors and graphic plotting on a map. The structural simplicity, the reliability, self-sufficiency and invulnerability to jamming of most geotechnical means have brought about their extensive use on planes and helicopters.

A shortcoming of this group of means is the relatively low accuracy of their navigational measurements, which limits the possibilities for using them on flights in difficult weather conditions, especially over the sea.

2. /Radiotechnical means of navigation/ function on the basis of measurement of the parameters of artificially created electromagnetic fields. These means include azimuthal systems, azimuthal-and-rangefinding systems, difference-range-finding (hyperbolic) systems, on-board panoramic radar sets and Doppler meters. We see that this subdivision of radiotechnical means is based on the nature of a measured parameter (angle, range, Doppler frequency and so forth). With respect to their designated purpose the above means are subdivided into long-range, short-range and inter-aircraft navigational and aircraft landing systems. Depending upon their purpose and their makeup, radiotechnical means of navigation assure the aircraft's precise arrival and accurate aiming of the target, determine the aircraft's position and navigational elements (drift angle, ground speed, true flight altitude and so forth), bring it to radio navigational points and provide for landings in difficult weather and at night. In addition, as the foreign press

reports, radiotechnical means make it possible to perform inter-aircraft navigational tasks (determination of aircrafts' reciprocal position, maintenance of the prescribed combat order, assembly and line up of aircraft for aerial refuelings and so forth).

As a primary source of navigational information radiotechnical means utilize artificially created electromagnetic fields (as distinct from the Earth's natural geophysical fields), and this is responsible for both their advantages and their shortcomings. The main advantage of radiotechnical means lies in the fact that their functioning is almost totally independent of weather conditions or time of day.

It is precisely for this reason that they have come to be extensively used on flights over the sea, out of sight of ground reference points, and for supporting aircraft landings in difficult weather and at night. Thanks to this rapidly developing group of technical means, it became possible during World War II and especially, during the period following the war, for air forces to conduct combat operations regardless of weather conditions.

The shortcomings of radiotechnical means include their susceptibility to artificial interference, added to the limited operational range of radio navigational systems (especially at low altitudes) and the dependence between the accurate determination of an aircraft's location on the distance from ground radio stations. We have already mentioned the fact that panoramic radar sets belong to this group. Such stations should also be classified as radio geotechnical means, however, since their functioning is based on radar irradiation of the Earth's surface.

Doppler meters of ground speed and drift angle are felt to be highly important for flights over the sea. Together with directional systems and automatic dead-reckoning instruments, they make it possible to determine the current coordinates of the aircraft's location.

3. The functioning of /astronomical means of navigation/ is based on the measurement of the parameters of extraterrestrial sources of navigational information in the form of light radiation or radio emanations from heavenly bodies or artificial earth satellites. They include automatic and nonautomatic aircraft sextants, photoelectric sextants, astrocompasses, celestial reference points and astro-inertial systems.

/Automatic or nonautomatic aircraft sextants make it possible to determine an aircraft's course and position at the point of intersection of two or more lines of position found by measuring the heights of heavenly bodies.

The main deficiency in the use of sextants lies in the fact that a certain degree of difficulty is involved in measuring the heights of bodies during a flight and the relatively long time required to process the data received.

The /photoelectric sextant/ automatically tracks heavenly bodies, giving their heights and azimuths on indicators during the period of operation of an averaging

mechanism. When the azimuth of a heavenly body is indicated on the control panel the sextant gives the true course of the flight. A computer can be linked to the sextant for determining the coordinates of the aircraft's position.

/Astrocompasses/ are designed for determining the aircraft's course relative to a meridian, for the longitude of which the sextant has been set. I would point out that the course is ordinarily used for flights in the middle latitudes, while a hypothetical course is used for Arctic flights.

/Astronavigation orientation devices/ are designed for automatically determining the coordinates for the aircraft's position and the flight course. The development of astronavigation devices, which was begun in the mid-1950's, was only made possible by achievements in optics, radioelectronics, automation and the field of gyroscopes.

The navigation process has been automated to the maximum possible degree in astronavigation orientation devices, which automatically find the direction of heavenly bodies and compute the coordinates for the aircraft's position. The use of astronavigation orientation devices on a flight requires that preliminary calculations be made on the ground, the training of telescopes on selected heavenly bodies and the monitoring of their "lock-on," especially when the aircraft makes turns, and so forth. Like astrocompasses, astronavigation orientation devices can be set for horizontal or equatorial coordinate systems. Astronomical orientation devices for the heliocentric system of coordinates, which begins at the center of the Sun, are used for determining the coordinates of a spaceship in interplanetary space. Employment of the principle of radio-astronomical measurements, which makes it possible to eliminate the basic shortcoming of astronavigation methods--the need for optical visibility of the heavenly bodies--has great advantages. Despite the fact that radio illumination of the heavenly bodies, particularly the Sun, was not detected until 1934, there are now more than 2,000 separate sources of galactic radio emissions.

The astroinertial systems have great advantages over astronavigation orientation devices.

/Astroinertial orientation devices/ differ from inertial navigation systems in that they employ for stabilization a sensitive element (an accelerometer) and use photo-electric tracking devices. When the heavenly bodies cannot be seen (during flights in clouds) the astroinertial orientation device automatically switches itself on in the "memory" mode, operating like a conventional inertial system with cumulative error in the determination of coordinates, which is "discarded" after visibility of the heavenly bodies has been restored.

The main advantage of astronavigation means, then, is their self-sufficiency, the fact that their accuracy in determining the aircraft's position does not depend upon the flight range, the fact that it is possible to employ them successfully far from shore.

4. /Illumination engineering navigation means/ utilize sources of artificial light. At the present time these means are used mainly in support of aircraft take-offs and landings.

And so, each of the groups of technical navigation means we have discussed has its own advantages and shortcomings, which are manifested in different ways under various navigational conditions. In flights over the sea, when it is impossible to measure the wind, automatic aerial dead-reckoning devices sharply reduce accuracy in the determination of coordinates. Magnetic compasses, which are the course sensors for them, do not assure normal functioning in the area of the Earth's magnetic poles or in areas of magnetic anomalies, especially during flights at low altitudes. Inertial systems function the same over land or over the sea, but as time passes error accumulates in them, and it may exceed acceptable levels. In order to reduce this error it is necessary periodically to adjust the functioning of inertial systems by determining the aircraft's position or its speed by means of radiotechnical or astronavigation means, as an example. The latter do not accumulate error, but they do not function when the heavenly bodies are not visible and therefore frequently cannot be used for low-altitude flights. Published works indicate that only combined navigation systems fully satisfy air navigation requirements.

When a combined system is created an attempt is made to give it great accuracy under any flight conditions and, in addition, to automate to the fullest possible degree all of the measurement, intercommunication and error correction processes. A self-sufficient device capable of operating continuously throughout the entire flight, even though it does not have a very high level of accuracy, is ordinarily taken as the basis for a combined system. Other elements of the combined system, which have a greater degree of accuracy under specific conditions, function separately and can be used for correcting the errors of the main device, which is a sort of "memory" for the entire system. The AN/ASN-24 is an example of a combined system. It is made up of the following components: an automatic navigational device (based on aerial dead-reckoning from data provided by a Doppler meter of drift angle and ground speed), a radar bombsight (for adjusting coordinates worked out by the automatic navigation device, when radar reference points are available), an astroorientation device (for adjusting coordinates during flights over the sea), and a short- and long-range radionavigation system. The process of adjusting errors can be semiautomatic or completely automated. In the latter case the combined systems are called self-correcting systems. For these systems the most important task lies in creating a special device making it possible to determine which data obtained from various sources of navigation information are the most important. For this purpose a computer must "weigh" the reliability of information from various adjusters and utilize the most accurate and reliable data for inserting corrections into the automatic navigation device.

A number of nations are engaged in the development of self-tuning and self-adjusting, combined navigation systems. These systems can automatically alter their makeup, depending upon flight conditions and the working condition of its separate components. A special automatic, self-adjusting device of a combined navigation system periodically checks the working order of all its components, including the computer (by solving a problem, the answer to which is known in advance, as an example), switches out defective equipment, replacing it with duplicate equipment, and constantly informs the crew of the combined system's working condition.

## AIR FORCES

### USE OF NAVIGATION SYSTEMS FOR AIR FLIGHTS

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[Article by Docent and Candidate of Technical Sciences Col N. G. Rachkovskiy:  
"Questions on Preparation for Flight When Using Complex Navigation Systems."  
Passages printed in boldface in source are set off in slantlines]

[Text] The Soviet and the foreign press have recently been publishing articles on the construction and the functioning of complex navigation systems designed for automating the navigational process. Complex navigation systems differ from all other navigation systems and instruments in that they always include a computer, which is the means of automating the process of resolving navigational problems. All of the technical means forming a part of the complex system and designed for measuring certain navigational elements in flight are used as transmitters of navigational information. A computer serves as the central elements linking together the airborne navigational equipment. By resolving navigation problems complex systems relieve the crew of the need to perform calculations on a flight and improve navigational accuracy and reliability.

All of the complex navigation systems described use the orthodromic system of coordinates for performing navigation tasks. Use of the orthodromic system of coordinates produces a number of specific features of theoretical and practical interest. Among other things, it should be borne in mind that the volume of pre-flight preparation increases somewhat when the orthodromic system of coordinates is used for performing navigation tasks. This is due to the fact that during flight preparation it is necessary to determine the orthodromic coordinates for all the primary reference points (opornaya tochka) on the route,<sup>1</sup> radar markers and the ground stations of radio systems, and to measure or compute azimuthal corrections. Automation of the navigation process has also produced certain peculiarities in the plotting of the flight route on a map.

With the above in mind, let us consider certain aspects of ground preparation for a flight when using complex navigation systems for flying over the sea.

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1. Here and throughout the article the term "reference points" for the route will refer to the flight departure point (ITM), the turning point of the run (PPM), the target and the flight terminal point (KPM).



## Selecting the Route and Plotting It On a Map

Selection of the route can be performed in the usual manner--on the basis of tactical, navigational and weather conditions. Plotting it on a map will involve the following.

First of all, the primary reference points on the route are indicated and joined together by orthodromes to form the prescribed line of flight. When necessary, intermediate points along the route are selected and indicated on this line to give the required accuracy to the navigation process. The permissible distance between primary and intermediate points on the route depends upon the method used in the navigation system for getting the aircraft to the designated spot, as well as upon the degree of accuracy with which the initial parameters (coordinates for the assigned points, coordinates for the aircraft's position, significance of the course and so forth) have been determined.

/If the aircraft is brought to the assigned spot by maintaining a zero angle between the ground speed vector and the direction to the assigned spot/ (so-called **ground-path navigation**), the permissible distance between primary and auxiliary points on the route is determined by the condition

$$P \leq 30 \sqrt{\frac{\Delta l_{\max}^2 - 2r_{a.p.}^2 - 2r_a^2}{\sigma_{in}^2 + \sigma_y^2 + \sigma_a^2}}, \quad (1)$$

Where  $\Delta l_{\max}$  is the aircraft's maximum permissible deviation from the line of the assigned route (for a probability of 95 percent);

$r_{a.p.}$ --the mean quadratic radio error in the determination of the aircraft's coordinates (position) in the given leg of the flight;

$r_a$ --the mean quadratic radio error in the determination of coordinates for given point;

$\sigma_{in}$ --the main quadratic value for instrument error in the determination of the angle between the ground speed vector and the direction to the assigned spot by means of the computer in the complex navigation system;

$\sigma_y, \sigma_a$ --mean quadratic errors in the determination respectively of the course and drift angle by means of transmitters in the complex navigation system.

The values for  $\sigma_{in}, \sigma_y$  and  $\sigma_a$  in formula (1) are given in degrees.

With errors in the initial parameters of  $r_{a.p.} = 3$  kilometers,  $r_z = 1$  kilometer,  $\sigma_{in} = \sigma_y = \sigma_a = 1^\circ$ , we derive the values given in the column "ground navigation method" in Table 1 for the acceptable distances between the primary and the auxiliary reference points of a route.

Table 1

Acceptable Distances Between Primary and Intermediate  
Reference Points On a Route, Using Complex Navigation Systems

The aircraft's maximum permissible deviation from the line of the prescribed route, $\Delta l_{\max}$ , km	Maximum acceptable distances between the primary and the intermediate reference points of a route, P, km	
	Ground naviga- tion method	Air route naviga- tion method
10	160	240
15	250	410
20	340	570

/If the aircraft is being brought to the assigned spot by maintaining a zero lateral deviation from the line of the assigned route, as determined in the computer of the complex system (air route navigation method), and if the line of the assigned route is defined by the coordinates of the reference point and the track angle, the permissible distance between the primary and intermediate reference points on the route are determined by the condition

$$P \leq \frac{30}{\sigma_1} \sqrt{\Delta l_{\max}^2 - 2r_{a.p.}^2 - 2r_z^2 - 4\sigma_{in}^2}, \quad (2)$$

where  $\sigma_1$  is the mean quadratic error in the determination of the force angle for the given leg of the route;

$\sigma_{in}$ --the mean quadratic value of the instrument error in the determination of linear, lateral deviation.

With errors of  $r_{a.p.} = 3$  kilometers,  $r_a = 1$  kilometer,  $\sigma_{in} = 2$  kilometers and  $\sigma_1 = 1^\circ$ , for example, we derive the values given in the column "Air route navigation method" in Table 1 for permissible distances between the primary and the intermediate reference points of the route.

Intermediate reference points of a route are indicated on the line of the assigned path in those cases when the distance between the primary reference points on the route exceed the values determined by means of formula (1) or (2).

It is expedient to select characteristic landmarks as the intermediate reference points of a route, although this is not absolutely necessary. On a leg of a flight over the sea, for example, there may be no sort of landmarks at all, but it is nonetheless necessary to designate intermediate reference points on the route. It is important that these points be arranged strictly along the line of the assigned path. The flight along the route will be performed by means of systematic input of coordinates for the next (primary or intermediate) reference point of the route into the computer of the complex navigation system.

The plotting of orthodromic legs of the flight route can be accomplished by two methods: analytical or graphic.

/The analytical method of plotting orthodromic legs of a flight route/ calls for calculation of the geographic coordinates for intermediate points of the orthodrome by means of certain spherical trigonometry formulas and is practically acceptable when the proper computer equipment is available. When it is not available the computation process requires considerable time.

/The geographic method of plotting orthodromic legs of a flight route/ is based on the possibility of replacing the orthodrome on the map with a straight line. An orthodrome can be depicted as a straight line only on central projection maps, which can be used for plotting the required orthodrome and then transferring it to a flight map by points. An orthodrome generally does not coincide with a straight line on maps of different projections.

The orthodrome's deviation from a straight line is determined by the specific features of the cartographic projections and depends upon the length of the orthodrome. By assigning the degree of permissible deviation, one can establish distances for a map of any projection, which make it possible to replace the orthodrome with a straight line. It is expedient to take one millimeter on the map scale as the criterion for the orthodrome's maximum permissible deviation from a straight line. The observance of this criterion makes it possible to plot the orthodrome with an overall accuracy coinciding with the possibilities of the map and characterized by a mean quadratic error of 1 millimeter on the map scale.

On Mercator's projection maps it is possible to replace the orthodrome with a straight line for the equatorial latitudes. Table 2 gives the lengths of orthodromes which deviate from the straight lines connecting their ends by no more than 0.35 kilometer on a map with a scale of 1:350,000.

Table 2

Permissible Length for an Orthodrome  
Replacing a Straight Line On a  
Mercator's Projection Map With a Scale of 1:350,000

Distance of mid-point on the orthodrome from the equator, km	Length of orthodrome (in km) which, on the map, deviates from the straight line connecting its ends by no more than 0.35 km
100	1060
200	750
400	530
800	370
1600	260

On maps of isogonic, cylindrical projection with a scale of 1:4,000,000, orthodromes no longer than 1,040 kilometers do not deviate from the straight lines replacing them by more than 4 kilometers.

The permissible length of orthodromes plotted in the form of a straight line on maps with stereographic, polar or modified, polyconic projection is shown in Tables 3 and 4. We can see from these tables that the most rigid limitations on the permissible length of an orthodrome apply when the plotting of orthodromes runs from one sheet to another of maps with modified, polyconical projection and a scale of 1:2,000,000 and 1:4,000,000.

Table 3

Permissible Length of Orthodromes Plotted In the Form of a Straight Line on Maps With Stereographic, Polar Projection (km)

True ground track of ortho- drome (degrees)	Latitude of initial point of orthodrome (degrees)					
	60		70		80	
	Map scale					
	1:2000000	1:4000000	1:2000000	1:4000000	1:2000000	1:4000000
0	Without limitations					
+30	890	1260	1070	1510	1510	2140
+60	680	960	820	1160	1160	1640
+90	630	890	760	1070	1070	1510

When greater lengths are involved the orthodromic legs of flight routes the intermediate points must be calculated by spherical trigonometry formulas so that the distance between them on a corresponding map does not exceed the figures given above. The orthodrome is drawn between the computed points by means of a straight-edge.

To increase the length of an orthodrome being plotted, which extends from one sheet to another of maps with modified, polyconic projection, one should either calculate the coordinates for the points of the orthodrome where the edges of the sheets meet or switch at that point to a map with a larger scale.

Table 4

Permissible Length of Orthodromes Plotted In the Form of a  
Straight Line on Maps with Modified, Polyconic Projection (km)

Orthodrome's disposition on map	Map scale		
	1:1000000	1:2000000	1:4000000
Located within the boundaries of a sheet	Without limitations, within a block of nine sheets	Without limitations in the meridional direction, up to 1,000 km in the latitudinal direction	
Passes from sheet to sheet in the meridional direction		390	200
Passes from sheet to sheet in the longitudinal direction		360	160

#### Constructing An Orthodromic System of Coordinates

A hypothetical equator of spherical coordinates is ordinarily taken as axis Y (Figure 1), called the main orthodrome, and a hypothetical meridian is taken as axis X.

The location of any point M with geographic coordinates  $\varphi, \lambda$  is indicated with the orthodromic coordinates Y and X, which are expressed in angle magnitudes or in kilometers. All directions, including the aircraft's orthodromic course, is measured as relative to axis Y.

At small distances from the main orthodrome the hypothetical meridians and parallels form practically a rectangular grid, which is the most acceptable when using a directional gyro and makes it possible to apply plane trigonometry formulas for performing the navigation tasks. The grid used for the NI-50 air position indicator is a well-known example of an orthodromic system of coordinates.

The following formulas are used for converting reference points from geographic coordinates to their orthodromic coordinates:

$$\begin{aligned} \sin X &= \sin \varphi \cdot \cos \varphi_v - \cos \varphi \cdot \sin \varphi_v \\ X &\cos (\lambda - \lambda_v) \end{aligned} \quad (3)$$

and

$$\cos y = [\sin \varphi \cdot \sin \varphi_0 + \cos \varphi \cdot \cos \varphi_0 \times \\ \times \cos (\lambda - \lambda_0)] \sec x, \quad (4)$$

in which  $\varphi_v, \lambda_v$  represent the latitude and longitude of a point at the vertex of the main orthodrome;  
 $\varphi_0, \lambda_0$  -- the latitude and longitude of the point at which the reading of the orthodromic coordinates begins.

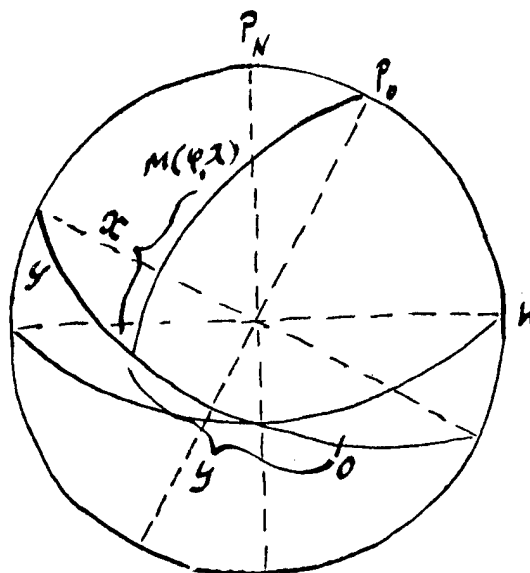


Fig. 1

An orthodromic system of coordinates can be constructed for a route, for a zone of operations or a flight area. It is expedient to make an orthodromic system of coordinates for each route during preparations for long-range flights. In this case it is good to run the main orthodrome through the target, so that it is on the average an equal distance from all points on the line of the assigned route and so that the beginning of the coordinates coincides with the target point. In a situation typical for the performance of missions in naval theaters, however, it is impossible to connect the system of orthodromic coordinates to each individual target. In this case, it is more convenient to extend the system of coordinates over the zone of operations or over the flight area, which embraces the base area and the area in which the targets are probably located (Figure 2)

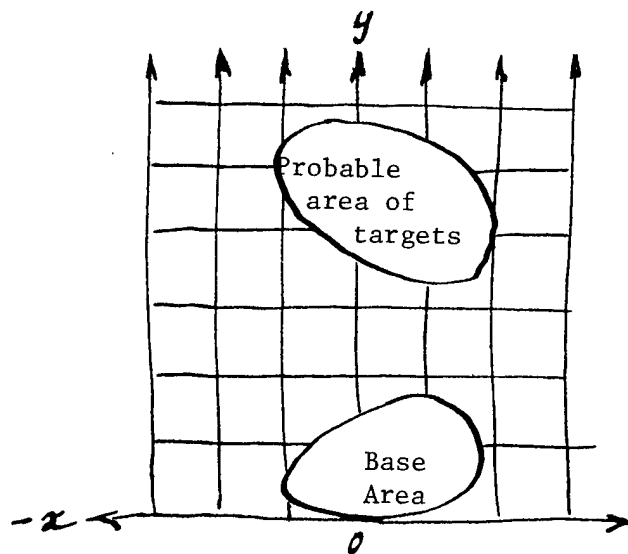


Fig. 2

When a flight route has been selected an orthodromic system of coordinates can be constructed for each leg of the route, as shown in Figure 3. The advantage of constructing the system in this manner lies in the fact that the aircraft's orthodromic coordinates will also be its route coordinates, which indicate lateral, linear deviation and the distance along the line of the assigned route to the route's turning point. This makes it possible to eliminate the re-calculation of coordinates and, as a result, increases navigational accuracy. The main shortcoming of this method lies in the need to switch to a new system of reading the course, the aircraft's coordinates and the main reference points (ground radio stations, radar markers and so forth) at each turning point. It should therefore be used with flight legs of considerable length, when it is relatively rarely necessary to switch from one system to another and this does not substantially complicate the crew's work.

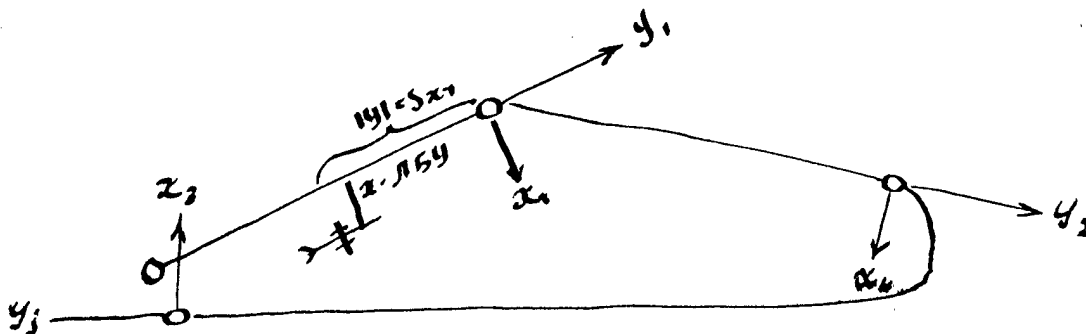


Fig. 3

In principle, it is not absolutely necessary to mark the system of orthodromic coordinates on the flight map. One must use a map with the configurations characterizing the system of coordinates used, however, in order to have a more graphic aid for performing the navigation tasks in flight, as well as to make it possible to use graphic methods of determining the data during the flight preparation.

It is sufficient to plot the main orthodromes on the map, when the orthodromic system of coordinates is linked to a separate route or to its legs. If the system extends over a zone of operations, however, or over a flight area, it is expedient to plot the coordinate grids.<sup>1</sup>

Use of the orthodromic system of coordinates is limited by two factors:

measurement of the course by means of course systems, the main operating mode of which is the directional gyroscope mode;

the performance of navigation tasks by means of plane trigonometry formulas.

The most rigid restrictions are produced by the first factor, because it determines the boundaries of applicability of the orthodromic coordinate system.

If the flight route lies a certain distance from the main orthodrome, this produces an error in the course indicated by means of the directional gyrocompass and measured in relation to the main orthodrome. The greater the distance, the greater the error.

For determining the required degree of permissible error in course  $\Delta y$ , the permissible degree of the aircraft's average deviation from the main orthodrome  $X_a$  is determined by the formula:

$$X_a [\text{km}] \leq 0.71 \cdot 10^6 \frac{\Delta y}{(y_2 - y_1) [\text{km}]}, \quad (5)$$

where  $y_2 - y_1$  is the change occurring in coordinate  $y$  between two consecutive adjustments of the directional gyroscope.

Table 5 gives the aircraft's permissible average deviations from the main orthodrome for condition  $\Delta y = 0^\circ, 5$ .

1. In order to plot coordinate grids on a map, one must first draw the main orthodrome and mark it off in 100-kilometer segments. One must then plot the orthodromes which intercept the main orthodrome at a straight angle at the designated points and which therefore constitute hypothetical meridians, and mark off equidistant points on the hypothetical meridians, calculating the distance from the main orthodrome and bearing in mind that "plus" is to the right and "minus" to the left. After this one should connect the points on the hypothetical meridians, which are equidistant from the main orthodrome, thereby deriving the hypothetical parallels. To complete the grid its squares should be subdivided into the required number of parts (numbering them for convenience of use) and draw the additional lines inside the squares.



Table 5

## An Aircraft's Permissible Average Deviations From the Main Orthodrome

Changes occurring in coordinate y during the time elapsing between two consecutive adjust- ments of the directional gyroscope	The aircraft's permissible deviation from the main orthodrome
500	720
1000	360
2000	180
3000	120

If the width of the configuration formed by the assigned path line exceeds double the figures for the value of  $X_a$ , then two or more orthodromic coordinate systems must be constructed.

## Determining the Orthodromic Coordinates or Points on the Route and Reference Points

There are two main ways of determining the orthodromic coordinates for points on the route and reference points:

- calculation by spherical trigonometry formulas;
- measurement on a map.

Formulas (3) and (4) can be used for calculating the orthodromic coordinates.

In order to measure the coordinates on a map one must drop a perpendicular line from the reference point to the main orthodrome and then measure the perpendicular (of coordinate x) and the distance on the main orthodrome from the start of the coordinates to the base of the perpendicular (of coordinate y).

Errors are made when measuring orthodromic coordinates for reference points on maps. There are a number of causes. The combined influence of these causes can be taken into account for each specific map, and conditions can therefore be defined, under which the error in the measurement of coordinates does not exceed a certain, fixed degree.

As before, it is expedient to take 1 millimeter on the map scale as the maximum acceptable error resulting from causes which can be taken into account. Accuracy in the determination of the orthographic coordinates in this case will coincide with the possibilities of the map and will be described by a mean quadratic error of 1 millimeter on the map scale.

The conditions for measuring orthodromic coordinates y are defined by two inequalities:

$$\left. \begin{array}{l} Y \leq Y_{\max}, \\ X \leq X_{\max}, \end{array} \right\} \quad (6)$$

indicating that on the given map coordinate  $y$  can be measured for reference points separated from the main orthodrome by a distance not exceeding  $X_{\max}$ , and the measured distance along the main orthodrome does not exceed  $U_{\max}$ .

The condition for measuring coordinate  $X$  is determined by the inequality:

$$X \leq X_{\max}, \quad (7)$$

which means that on the given map measured coordinate  $X$  does not exceed  $X_{\max}$ .

The conditions for measuring the orthodromic coordinates or reference points on maps with various projections are given in Table 6

Table 6

Conditions for Measuring Orthodromic Coordinates for  
Reference Points on Maps With Various Projections

Kind of projection with which the map was made	Map scale	For coordinates $y$		For coordinates $x$	
		Acceptable distance of refer- ence point from orthodrome (km)	Acceptable distance when measured along main orthodrome (km)	Acceptable distance from reference point to main orthodrome (km)	
				Number of points used for construc- ting main orthodrome	Main ortho- drome replaced by straight line
Mercator's	1:350000	50	110	100	60
Oblique, isogonal, cylindrical	1:4000000	400	270	450	270
Stereographic, polar	1:2000000	$250 \div 440$ $380 \div 380$	Without limitations when using scale at middle meridian of map sheet		
Modified, polyconic	1:1000000	120	440	710	430
	1:2000000	80	230	370	240
	1:4000000	40	150	250	150

Notes: 1. Conditions for map with Mercator's projection are valid within a zone of  $\pm 5^\circ$  from the equator.

2. If the main orthodrome coincides with the axial line of a map with oblique, isogonal, cylindrical projection, then coordinates  $x$  and  $y$  are measured without limitations, and the measured value for coordinate  $y$  is multiplied by the coefficient 1.009.

3. When measuring coordinate  $y$  on maps with stereographic, polar projection, the reference point's acceptable distance from the main orthodrome depends upon the latitude for the base point of a perpendicular dropped from the given reference point to the main orthodrome. The smallest values for the range of permissible distances given in the table apply to latitude  $65^\circ$ , the largest--to latitude  $90^\circ$ .

Both the analytical and the graphic methods of determining coordinates have advantages and shortcomings. The analytical method is free of limitations, is applicable to all reference points in the accepted orthodromic coordinate system and provides a high degree of accuracy, but when no computers are available a considerable amount of time is required to make the calculations with the formulas. The graphic method is simple and makes it possible to determine coordinates for reference points more rapidly, but, as shown in Table 5, involves limitations with respect to the measured coordinate distances and its accuracy is limited to a value of 1 millimeter on the map scale.

Selection of the method depends upon the amount of time available and the degree of accuracy required for determining the orthodromic coordinates. The initial value for determining the required accuracy should be the accuracy with which the coordinates of the aircraft's location are measured, using the technical means employed in the given complex navigation system. In order for the possibilities of these means to be realized, the errors in the determination of coordinates for the reference points must not make up more than one-third of the total error involved in the determination of the orthodromic coordinates for the reference points.

After the map has been selected the orthodromic coordinates for the reference points can be defined graphically, taking into account the limitations indicated in Table 5. When the orthodromic coordinates being measured exceed those limits indicated in Table 5, a combination graphoanalytical method can be used for determining the coordinates. This method essentially consists in calculating the coordinates for a certain number of points, which then make it possible to measure additions to the specific coordinates for the reference points within the limits indicated in Table 5.

#### Determining Orthodromic Track Angles (putevyye ugly)

It is absolutely necessary to determine the orthodromic track angles for the flight route legs, when the complex navigation system employs the method of leading the aircraft to the assigned spot by maintaining zero value for lateral, linear deviation and when the assigned track line is determined by the coordinates for the assigned point and by the track angle of the flight leg. In all other cases, the orthodromic track angles for the legs of the flight route have only auxiliary importance, making it possible to monitor the automated piloting process.

The required accuracy for determining an orthodromic track angle depends upon its purpose.

If the track angle is to be fed into a complex navigation system for purposes of deriving the current degrees of lateral, linear deviation and the remaining distance, then the permissible errors are described by the value  $0^{\circ}.2-0^{\circ}.4$  (from the mean quadratic value). This degree of accuracy can only be assured by calculating the track angle by the following formula:

$$\operatorname{tg} \beta = [\cos x_1 \cdot \operatorname{tg} x_2 - \sin x_1 \cdot \cos(y_2 - y_1)] \operatorname{cosec}(y_2 - y_1), \quad (8)$$

where  $x_1, y_1$  are the orthodromic coordinates for the initial point of the flight leg;

$x_2, y_2$ --the orthodromic coordinates for the terminal point of the leg.

An accuracy of  $1-2^{\circ}$ , which is always assured in map measurements, is fully acceptable for this purpose, when the orthodromic course angle for the flight leg is used for controlling the automated navigation process.

#### Determining Azimuthal Adjustments

Angle figures not given in the orthodromic coordinate system may enter the computer of a complex navigation system. The angle-and-range-finding radio system ordinarily gives the aircraft's azimuth as measured in relation to the geographic meridian of a ground station, for example. The directional system is frequently employed for measuring the course relative to the geographic or the magnetic meridian of a gyroscope correction point. In such cases the task of converting the incoming angle figures for the orthodromic coordinate system is performed in the computer of the complex navigation system by making azimuthal adjustment  $\Delta_A$ . The essence of this process is described by Figure 4 (the dashed lines in the drawing indicate hypothetical parallels of the orthodromic coordinate system).

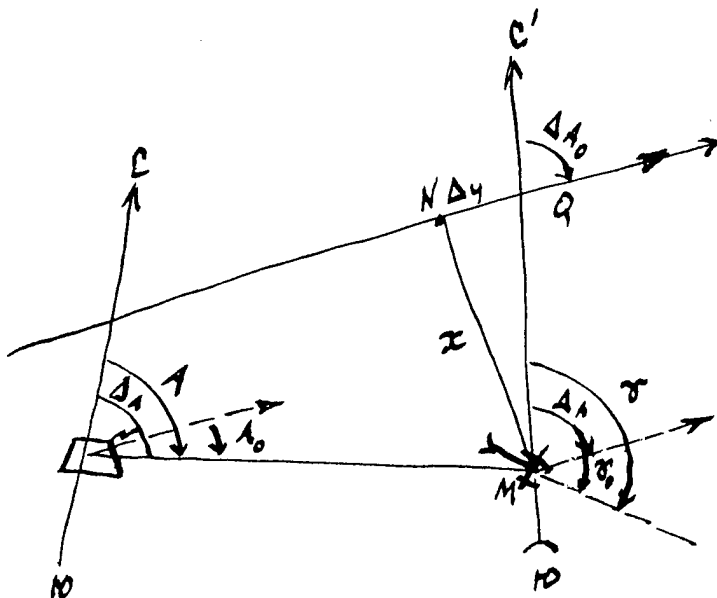


Fig. 4

If the aircraft's azimuth  $A$  is measured as relative to the geographic meridian, then orthodromic azimuth  $A_o$  will be

$$A_o = A - \Delta_A. \quad (9)$$

Orthodromic course  $\gamma_o$  is found by a similar method, with known course  $\gamma$  measured in relation to the geographic meridian of a correction point on the directional gyroscope:

$$\gamma_o = \gamma - \Delta_A \quad (10)$$

Azimuthal adjustments are determined before the flight and are fed into the computer of the complex navigation system.

The azimuthal adjustments can be calculated by the following formula:

$$\begin{aligned} \operatorname{tg} \Delta_A = & [\sin \varphi_r - \cos (\lambda_r - \lambda_v) + \\ & + \cos \varphi_r \cdot \operatorname{ctg} \varphi_v] \operatorname{cosec} (\lambda_r - \lambda_v), \end{aligned} \quad (11)$$

where  $\varphi_r, \lambda_r$  are the latitude and longitude for the point where a ground station of the radio system is located;  
 $\varphi_v, \lambda_v$  -- the latitude and longitude for the point at the vertex of the main orthodrome.

The azimuthal adjustment can be measured right on the map for directional systems making it possible to measure the course with a precision of  $1-2^\circ$ . In this process it is convenient to measure the angle at which the meridian of the directional system's gyroscope correction point intersects the main orthodrome (angle  $\Delta_{Ao}$  in Figure 4), assuming that this angle does not differ significantly from angle  $\Delta_A$ ).

The difference between angles  $\Delta_A$  and  $\Delta_{Ao}$  equals the spherical excess of triangle MNQ and does not exceed  $0^\circ.66$ , when the length of sides X and  $\Delta_y$  of this triangle is less than 970 kilometers. Azimuthal adjustment  $\Delta_A$  for the course can therefore ordinarily be replaced with angle  $\Delta_{Ao}$  within the limits of applicability of the orthodromic coordinate system.

It should be borne in mind that an azimuthal adjustment measured in relation to a magnetic meridian and taken inversely equals the hypothetical magnetic variation. Hypothetical magnetic variation  $\Delta M_y$  can be used for converting from a magnetic ( $\gamma_m$ ) to an orthodromic ( $\gamma_o$ ) course in accordance with the formula:

$$\gamma_o = \gamma_m + \Delta M_y. \quad (12)$$

## Using Spherical Trigonometry Formulas for the Calculations

Calculation of the orthodromic coordinates for reference points, course angles, azimuthal adjustments and other distances and angles on the Earth's surface for air navigation purposes, using spherical trigonometry formulas, is ordinarily performed with the assumption that the Earth is a sphere and that the spherical coordinates are the same as the geographic coordinates. We know that relative errors in distances in this case reaches 0.5 percent, and errors in angles--0<sup>0</sup>.5.

Errors in calculations made with spherical trigonometry formulas can be reduced considerably by using the method proposed by Professor V. Kovraskiy for constructing the globe. The method essentially consists in depicting a spheroid on the globe, the scale of which is the most constant and deviates the least from the globe's main scale. Accepting the globe's main scale as equal to 1, it can be seen that this approximation of the spheroid to the globe is fully applicable to all the problems solved relative to the Earth's surface with spherical trigonometry formulas.

The method described amounts practically to the following:

1. Geographic coordinates  $\varphi, \lambda$  for points on the Earth's surface are converted into spherical coordinates  $\varphi_c, \lambda_c$ , using the formulas:

$$\varphi_c = \varphi - \frac{3}{4}c \sin 2\varphi \approx \varphi - 9' \sin 2\varphi; \quad (13)$$

$$\lambda_c = \lambda, \quad (14)$$

where  $c$  is the Earth's traction, approximately 1/300;

2. For calculating the distances between the given points for the corresponding directions, spherical coordinates  $\varphi_c, \lambda_c$  for these points are substituted in spherical trigonometry formulas (3), (4) and (8), for example;

3. For converting from angle distances derived by using spherical trigonometry formulas to linear distances, 6373 kilometers is taken as the radius of the globe; the maximum distortion of differences in this case is 0.08 percent, and angle distortion does not exceed 6'.

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## NAVAL FORCES

### USE OF SCIENTIFIC METHODS IN OPERATIONS RESEARCH

Moscow MORSKOY SBORNIK in Russian No 6, Jun 62 pp 22-30

[Article, title as above, by Rear Adm N. I. Nikol'skiy]

[Text] The rapid development of science and technology in recent decades and the appearance of fundamentally new types of weapons mean that commanders at all levels and of all services of the forces must be able rapidly to make scientifically based decisions, precisely assign the missions to their subordinates and persistently strive to achieve the assigned objective. In many cases commanders must make decisions and organize operations in totally new conditions, conditions they have not encountered before, solely on the basis of theoretical analyses and summarizations. It is obvious that only those commanders who have mastered the scientific methods of operations research will be capable of successfully performing the assigned missions.<sup>1</sup>

The scientific method must be based on the principle of Marxist-Leninist philosophy, which regards the acquisition of knowledge as a systematic dialectical process of transition "from vital contemplation to abstract thought and from it to practical application."<sup>2</sup> The use of scientific methods in operations research is based on the performance of observations of actual phenomena, on statistical analysis of the data obtained, the development of analytical models of the operations under study and their use for forecasting the progression and the outcome of operations, depending upon the changes occurring in certain conditions.

The process of scientific operations research should always be considered in light of the assigned task and the specific class or type of operations. The nature and the sequence of the research may vary in accordance with the conditions and the methods employed.

The ultimate objective of operations research is to achieve the best results in a specific situation, that is, to find ways of improving the results of planned operations or of those already being conducted on a regular basis. For this purpose it is necessary to discover the general principles of an operation and the laws governing it and to determine how the results depend upon the method of control.

Operations research methods can be used in military affairs for performing the following tasks:

1. for determining the effectiveness of existing and projected kinds of weapons and technical equipment;
2. for analyzing the effectiveness of various control methods and tactical procedures;
3. for analyzing various aspects of military operations and for developing the quantitative bases for future decisions;
4. for assessing the probability of success with various methods of operation and for selecting the best of them.

Operations research in the navy covers three main areas of parameters affecting the progression and the results of an operation: the tactical and technical features of weapons and equipment, tactical procedures and methods for utilizing personnel and equipment in military operations.

The revelation and precise determination of the tactical and technical features of weapons and equipment consist mainly in analyzing the causes and the factors affecting their effectiveness for purposes of determining the possibilities for improving weapons and equipment and ways of doing so. The development of tactical procedures covers the creation of the most effective, new and more expedient actions and counteractions (the objective of the latter is to parry the enemy's combat efforts). The study of methods for utilizing forces consists in comparing their advantages and their shortcomings under various conditions, determining the most productive methods of performing missions and the directions for applying combat efforts and substantiating norms for the utilization of forces in the performance of standard tasks.

Most analysis methods consist in calculating the maximum<sup>3</sup> gains resulting from operations and their cost, and in determining the parameters insuring maximal gain at minimal cost.

It is not always possible to employ strict mathematical methods for accomplishing tasks by finding the hypothetical extremes, however. In the first place, in a war it is not possible to obtain exhaustive information for working out a completely sound decision, and secondly, existing methods for arriving at analytical decisions with the large number of variables may require an unacceptably large amount of time for calculating and analyzing all the variants, even with the use of high-speed electronic computers.

Operations research has prompted the development of special new mathematical methods for arriving at optimal decisions--linear and nonlinear programming, the queueing theory, the theory of games and so forth. Mathematical methods should not be taken as the essence of operations research, however, as some specialists do, since physics should not be confused with the differential equations of physics. Physics cannot function without mathematics today, but this does not mean that physics has become a part of mathematics. Mathematics has the same importance for operations research.



Operations research calls for the mandatory study of accumulated know-how for determining the influencing factors and for the thorough development of the theory (or hypothesis) for the scientific clarification of these factors. Facts and theory are used for deriving a prognosis of future operations.

The scientific operations research method consists of the following phases: research preparations; performance of the research; the development of recommendations and adoption of a decision.

#### Research Preparations

This phase can, in turn, be broken down into the following main stages:

1. formulation of the problem and description of the research task; specification of the problem and of its place among the other problems;
2. the study of the situation in which the given operation is being conducted;
3. determination of the subjects and values for the research in accordance with the task and the situation; the collection of quantitative data on the operations to be conducted;
4. selection of the scientific research methods.

Formulation of the problem and definition of the task constitute the most important element of the research, since the ability to identify and properly define the task frequently determine the success of the entire study.

The research objective is ordinarily formulated (generally defined) as the achievement of maximum effectiveness for the operation. The task is ordinarily defined in detail later, in the course of the research. Despite the fact that the amount of time spent defining the task should always be reduced as much as possible, it is nonetheless essential when beginning a study to avoid haste in defining the task (even under wartime conditions), since this can throw the entire job off course. At the same time the study of a number of questions can and should be started immediately after the problem is revealed, even before the task is ultimately defined. This is all the more important, since in certain studies the proper definition of the task provides an immediate solution to the problem and all the research amounts to finding the required criterion of effectiveness for the operation, the criterion corresponding to the proper definition of the task. Specifically, during World War II, the British and the Americans resolved the problem of arming transports with antiaircraft artillery, the problem of consolidating transatlantic convoys and certain others.<sup>4</sup>

The study of the situation is ordinarily made on the basis of a statistical analysis, the performance of which requires a large quantity of data obtained under identical conditions. This makes it possible to compare the results obtained to determine their effect upon the course and the outcome of the operation.

The military situation (in the broad sense of the word) is the determining factor for selecting the research method for military operations. The dynamics

of combat for aircraft-carrier formations, for example, and the great diversity of specific battles and engagements occurring between them limit possibilities for determining the direct functional dependencies among the separate parameters for the operations being studied. One battle ordinarily differs from another by a large number of independent variables and it is extremely difficult to determine their influence upon the outcome of operations. When the research involves such complex situations it is therefore necessary to break them down into more simple components and to analyze piecemeal.

The subjects and the values for the research are ordinarily determined on the basis of a statistical analysis of the parameters influencing the specific operation. The following factual materials are used in actual situations: maps, reports, summaries and so forth in a combat situation, and the results of direct observations with the performance of precise measurements, modeling and so forth, in experimental conditions. The number of parameters affecting an operation is ordinarily very large, and most of these are variables.

The working model for studying a problem is generally presented in the following form:

$$E = F(x_i y_j),$$

where E is the effectiveness of the system being studied;

$x_i$ --dependent variable systems;

$y_j$ --independent variable systems.

The objectives of a study are ordinarily functions of one or several variables.

Before performing the analysis of the given operations and deriving conclusions, one should carefully study the formulation of the task and available information and assess the time allotted for resolving the problem. In addition, it is essential to determine the degree of precision required for the observations and for the task performance results. Methods for resolving the problem are selected after this has been done.

The selection of methods for the scientific research is determined by the need to resolve the problem in the best possible manner. The quantitative data for performing the research can be obtained by performing a statistical analysis of actual events, by conducting special experiments under combat conditions or experiments in conditions approximating a combat situation to the maximum possible degree or by means of mathematical modeling with electronic computers.

It is perfectly obvious that the most accurate and objective data should be expected from a scientific analysis of actual combat operations. When possible, the conclusions and recommendations obtained should be experimentally verified in combat operations by making in the procedures for using one's own forces those changes which helped to achieve the best results. It is perfectly obvious that such experiments can only be conducted in time of war.

In peacetime experiments under realistic conditions are only possible in the area of noncombat operations--the transporting of cargo, the production of weapons and so forth. However, such experiments do not provide completely realistic characteristics of the operations being studied, even under conditions approaching actual combat to the maximum possible degree. Furthermore, they require a considerable amount of time and extensive material outlays.

For example, it took the British around a year to conduct research to determine the practical establishment of a blast zone for depth charges during World War II. When one considers the fact that during this year German submarines sank a considerable number of commercial vessels (a combined water displacement of around a million tons), it becomes apparent that such tasks have to be performed as rapidly as possible.

Mathematical modeling with electronic computers, or program modeling, is now acknowledged as the most effective method of conducting operations research.

#### Performance of the Research

The findings from the previous phase are used in the phase of performing the analytical and experimental studies. The research is performed in the following main stages:

1. analysis and synthesis of the operation's quantitative characteristics;
2. selection of criteria of effectiveness and parameters for the study;
3. construction of a model of the operations; additional observations and experimentation for testing the hypothesis.

In the analysis and synthesis of the operation's quantitative characteristics the quantitative data collected on the operation under study are subjected to thorough analysis to find the scientific explanation for the results of the observations and their functional relationship to the actual features of the guns and equipment used or to the actual operational tactics of the forces involved in the operation. The main objectives of the operations research are achieved on the basis of this analysis: the forecasting of results from the performance of a new weapon, the development of new and improved tactics, and so forth.

Let us consider certain methods for analyzing an operation's quantitative characteristics.

The a priori research method consists in selecting only certain ones from among the numerous variable parameters, those which are the most important, which describe the course and the outcome of the operation and lend themselves best to quantitative processing. It is assumed that all the remaining parameters remain constant or do not significantly affect the process under study. This assumption may prove to be incorrect, in which case it will be necessary to expand the study and use additional parameters. The unsoundness of the initial assumption can only be revealed after thorough quantitative analysis, however. Differentiated equations are then compiled and the solution is found.<sup>5</sup>

The difficulty in the use of the a priori method lies in the fact that it requires extensive simplification of the combat situation and is ordinarily only applicable to operations of homogeneous forces. After arriving at a solution with a certain number of variables and discovering the need to introduce yet another variable, it is frequently necessary to start the entire study over again.

The argument variation method consists in analyzing changes in the operation's characteristics dependent upon changes in certain variables (tactics or the features of the weapons used, for example).

Let us say that the result of certain military operations is defined by the values  $y_1, y_2, \dots, y_n$  (let us call these the initial values), which are functions of a large number of parameters or arguments of actions  $x_1, x_2, \dots, x_n$ . Some of these can be quantitatively evaluated, while others can only be qualitatively assessed. It is therefore ordinarily impossible to arrive at the mode of function  $y = F(x_1, \dots, x_n)$ . Result  $y$  from an analysis of past operations under specific conditions is used for predicting result  $y'$  for future operations under new conditions.

If only certain variables are changed (within a limited range), it is possible to determine frequent derivatives  $\frac{dy}{dx_s}$  of the outcomes for various arguments, and sometimes also the ultimate form of frequent function  $y = F(x_s)$ , although ordinarily only the first derivatives can be found. With the frequent derivatives defined the premises are created for a quantitative appraisal of the effectiveness of possible changes in weapons, tactics and personnel training and for predicting the results.

When the new conditions differ sharply from those of the past the problem becomes a priori and, as we have already noted, is frequently insoluble.

The above circumstances require a very careful approach for applying the argument variation method, which is always based upon common sense, stability of tactics and the characteristics of the weapons used.

And so, at the beginning of a study one must appraise the largest number of derivatives possible, first of all, tactical derivatives, in order to consider what changes in tactics will lead to improved results, and then the technical derivatives, in order to assess the effect from the employment of the improved weapon. This sequence is essential in order to avoid the unjustified replacement of a weapon which could produce good results with different tactics.

As an example of research performed by the argument variation method let us consider an analysis of transport losses from convoys in the North Atlantic in 1941-42.<sup>6</sup> The following patterns were established by an analysis of the effect from changes in the makeup of the convoys and in their traveling speed.

Increasing the number of guardships from 6 to 9 reduced transport losses by 25 percent. Increasing the number of transports in a convoy from 32 to 54 reduced transport losses by 56 percent. Increasing a convoy's speed from 7 to 9 knots reduced

losses by 43 percent. The patrolling of an air guard for 8 hours each day reduced losses of convoy vessels by 64 percent during the second half of 1942.

In each situation for which the value of these four derivatives were determined, the average value of the other variables was almost unchanged, and the results obtained actually constituted four partial derivatives. If we accept the fact that these derivatives are causally dependent, we can appraise navigational safety in 1941-42 from four factors: the numerical strength of the guard, the makeup of the convoy, the convoy's speed and the makeup of the air guard. By comparing the derivatives we can conclude that in the absence of air cover assuring the same degree of convoy security, the number of guard ships should be increased from 6 to 14. One should take into account, however, the fact that such a large extrapolation can produce serious errors. The number of ships must be increased correspondingly to provide for the average (6-10 transports) slow-moving (7 knots) the same degree of security as for the average high-speed (9 knots) convoy. When a convoy is enlarged from 32 to 54 transports, the number of guard ships should be increased from 6 to 11 to provide the same degree of security.

The above calculations make it possible to roughly compare the usefulness of various possible changes and to arrive at the maximum gain by slightly increasing certain factors (convoy speed, for example).

The statistical method makes it possible to produce adequately substantiated quantitative forecasts and recommendations even in those operations in which such incidental factors as the personal capabilities of the personnel do not appear at first glance to be manifested. It is therefore employed when variations of every possible behavior on the part of enemies are combined with the probability characteristics of random arrangements of events and situations, that is, in those cases in which the forecasting of the results of operations is imprecise (which is especially typical of military operations).

As an example of the use of the statistical method for military purposes we can mention the attempts made by the British in 1941 to find ways of making the daytime operations of antisubmarine defense aircraft more effective. Statistical data on the situation at the moment the aircraft employed their weapons show<sup>7</sup> that the submarine was observed visually when the bombs were dropped in 34 percent of all the attacks, that it managed to submerge 15 seconds before the bombs were dropped in 27 percent of all the attacks, 15-30 seconds before the bombs were dropped in 16 percent, 30-60 seconds in 12 percent, and 60 seconds or more in 11 percent of the attacks. It is apparent from these data that experimentally derived function  $p = f(t)$ , in which  $t$  is the time elapsing between the submerging of a detected submarine and the moment bombs were dropped on it from an aircraft, was unstable: It remained almost unchanged throughout 1942, both in the central Atlantic and near the eastern coast of the United States. This situation did not change until the aircraft and submarines were equipped with radar. The form for this function depended upon a number of exceptionally complex factors--the pattern of the state of fatigue on the part of observers on the submarines and on the aircraft, for example. It is perfectly clear that had the observers on the submarines always

been vigilant, not a single submarine would have been attacked on the surface in good visibility. Consequently, the true effectiveness of the ASW operations of the aircraft depended in great part upon the vigilance of observers on the submarines.

The complexity of factors characterizing the operations produces the difficulty of analytically forecasting their possible outcome from the initial characteristics. Nonetheless, an analysis of the statistical data given in the table made it possible for the British to determine the effect of certain factors and to make operations conducted by aircraft against the German submarines considerably more effective.

With respect to the influence of the aircraft speed upon the effectiveness of operations carried out by aircraft against submarines, if we accept the fact that reciprocal detection by the aircraft and the submarine depends entirely upon the distance between them, then an increase in the aircraft speed (and, consequently, a reduction in the time elapsing between the detection of a submarine and the moment the bombs are dropped) results in an increased number of submarines attacked prior to submerging.

The experimentally determined optimal speed for an aircraft during a search produced a certain increase in the number of submarines attacked prior to submerging.

With respect to the influence of aircraft camouflaging upon the effectiveness of operations conducted against submarines, it was experimentally established that changing an aircraft's color from black to white reduces its detection distance by 20 percent. This made it possible for white aircraft to detect and attack more submarines than did the black aircraft (since some of the submarines managed to submerge unnoticed upon detecting a black aircraft).

With respect to the effect from changing the depth at which depth charges exploded upon the effectiveness of operations conducted against submarines,<sup>8</sup> an analysis of the statistical data compiled made it possible to determine that the probability of damaging a submerging submarine depends upon the probability that the depth charges will fall within the submarine's zone of destruction with respect to depth-- $P_1$ , and horizontally-- $P_2$ :

$$P = P_1 P_2.$$

The value of  $P_2$  depends mainly upon sighting accuracy, while  $P_1$  depends upon the depth at which a charge's detonator is placed. It was established by numerical analysis of the statistical data that the detonator depth should be reduced to 7.5 meters and that depth charges should not be dropped upon submarines which have managed to submerge more than 30 seconds prior to the attacks.

Application of the conclusions given above made it possible to increase the effectiveness of operations conducted by British aircraft against German submarines two-fold, without any additional expenditures.<sup>9</sup>

## Selecting the Criteria of Effectiveness and the Parameters for the Research

The success of a study depends upon the correct selection of criteria of effectiveness, and in a number of cases the accomplishment of the research task is clearly determined by the selection of criteria. Taking as a criterion the percentage of losses of transports crossing the ocean (instead of the number of transports sunk in a convoy), for example, brought out during World War II the expediency of increasing the number of transports within a convoy and made it possible to beef up the guard correspondingly, which reduced convoy losses even more.

Of the various criteria for assessing the effectiveness of an operation as a whole, one should select that criterion which reflects with a greater degree of discrimination the dependency between the outcome of the operation upon the conditions in which it is conducted, and which makes it possible to assess the most important features of the operation's outcome. After selecting the criteria, one determines the parameters of the operation which have a greater effect upon its outcome (that is, upon the numerical value of the criterion of effectiveness used) and makes a study of the nature of the dependency between the results of the operation and the nature of the changes occurring in the criteria selected.

Since the objective of the research is that of achieving the optimal result from the operation as a whole, the criterion of effectiveness should also reflect the results of the operation as a whole. The criterion which satisfied this requirement is called the general criterion (in contrast to specific criteria). The product of three specific criteria could be taken as the criterion of effectiveness for a separate long-range bomber, for example: average number of bombing runs per month, average bomb load and average percentage of bombs falling within 300 meters of the target.

Achievement of the extreme value for one of the specific criteria obviously does not always result in the achievement of the best results in general. Furthermore, it is sometimes possible to improve the other criteria at a cost of deterioration for one of them and thereby, to sharply increase the overall effectiveness of operations.

Criteria of effectiveness are expressed in various ways, but most frequently in the form of standards or ratios. The criterion of effectiveness for a search, as an example, might be the ratio of actual search speed to the theoretical speed; the criterion of effectiveness for antiaircraft fire--the ratio of the number of shells fired to the number of aircraft shot down, and so forth.

When forecasting the results of military operations it is most expedient to express measures of effectiveness in terms of probability characteristics (the probability that the mission will be completed, for example, the probability that a ship will be destroyed, the mathematical expectation for the number of aircraft shot down, and so forth).

When building the model of an operation, proposals or hypotheses are formulated for explaining and arranging facts obtained from observations and experiments. These, in turn, are verified experimentally or through additional observations. A good hypothesis can predict what should transpire and explain what has previously occurred, but no hypothetical supposition should be regarded as the absolute truth. Nonetheless, if the solution to a problem has been achieved by means of a model, the results of the modeling do make it possible to make useful forecasts.

A model making it possible to analyze an operation as a whole is essentially a set of hypotheses or the objective expression of certain aspects of the problem achieved by structuring theoretical assumptions which shed light on many of the questions involved. Any model is limited by assumptions, however, and diverges from the actual operation.

Naturally, a model should reflect the process modeled as completely as possible. It is therefore only possible to alter the values and the parameters for an operation, to study and forecast the possible results of specific actions and find ways of improving the operation as a whole after it has been established that the model created depicts the system being modeled with adequate precision.

After the model of the operation has been constructed, additional observations and experiments are conducted for testing the hypotheses. If any component of the hypothesis has not been experimentally confirmed, then the hypothesis as a whole has not been confirmed. After the data obtained have been analyzed in the light of the effectiveness criteria, hypotheses are accepted or rejected, the results which will emerge from the hypotheses accepted are forecast, and the results are summarized and reviewed.

#### Development of the Recommendation and Adoption of a Decision

A report is compiled on the basis of the research conducted, which indicates the situations and the assumptions which went into the foundation of the study, and possible operations methods, after which the conclusions and recommendations derived are formulated. It is precisely in this phase that the practical task of the operations research--the forecasting of results and ways to optimize them--is fully manifested. Demonstrativeness and graphic clarity are therefore an absolute condition for success in the research. A commander adopting a decision on the basis of research must be confident that the recommendations are reliable and that success is assured.

For this to be true the research conclusions must formulate a guaranteed probability of success and give the probability for obtaining various possible results. In many cases this makes it possible to take a justified risk in order to avoid defeat when the enemy has an overall superiority in forces, or to achieve decisive results, even though, possibly, with extensive losses. In order to adopt a decision on the basis of the conclusions and recommendations coming out of research, the commander should appraise once more their acceptability and the possible consequences of errors. In doing so, he should not go to extremes: totally rejecting



the proposed solution, if it "appears" doubtful from generally accepted, stand-points in life, or, on the other hand, blindly to implement it simply because it has been developed by scientists, even with the aid of electronic machines.

The accuracy and reliability of conclusions and recommendations based on research are determined by the accuracy and completeness of the initial information and the degree of strictness with which the situation model was developed. It follows from this that the decision as to whether to trust in the proposed recommendations on the basis of an aware assessment of these factors is a personal matter in every case. Furthermore, the commander who has the authority to make the decision and who bears responsibility for its consequences must creatively assess not only the research findings but also all of the remaining factors which do not lend themselves to quantitative expression (the morale factor, the commanders' training, their initiative, the suddenness of the actions, the political and military importance of the assigned mission and its affect upon the overall course of military operations). The commander uses this as the basis for determining the degree of acceptability of recommendations made on the basis of research.

Most military operations are of a probability nature, and the formation commanders always have to select one of the possible decisions. The commander can receive a great deal of assistance in this matter from specialists in operations research, and electronic computers can free the commander and his staff of the need to perform the extensive, labor-consuming work of selecting, summarizing and processing the information and performing the necessary calculations. All of this considerably expands the commanders' creative possibilities and enhances their role and their effect upon the course and the outcome of military operations.

Use of the scientific methods of operations research in units and formations creates the basis for a correct and thorough assessment of a situation, expands the knowledge and the experience of the commanders and makes it possible to find a good way out of bad situations and to achieve the best of the possible results of operations by personnel and equipment under their command.

#### RECOMMENDED LITERATURE

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2. Williams, D., "The Compleat Strategyst," "Sovetskoye radio" publishing house, 1960.
3. Merrill, G., Goldberg, G. and Helmholtz, R., "Operations Research, Combat Units, Firing the Projectiles," translated from English, "Izdatel'stvo innostrannoy literatury," 1959.

#### FOOTNOTES

1. In this article an operation is considered to be any organized action (including military) conducted according to a definite plan to achieve a specific objective.
2. V. I. Lenin, "Soch." [Works], Vol 38, p 161.
3. Maximal or minimal, according to the conditions of the task to be accomplished.
4. See F. Morse and D. Kimbell, "Operations Research Methods," translated from English, "Sovetskoye radio" publishing house, 1956.
5. In some cases (for analyzing an air battle, for example) the Lanchester theorem is taken as the basis for the a priori method.
6. Blacket, "Operations Research," THE ADVANCEMENT OF SCIENCE, 1948, Vol 5, No 17.
7. The data are taken from Blacket's article "Operations Research" in THE ADVANCEMENT OF SCIENCE, 1948, Vol 5, No 17.
8. In 1942 British ASW aircraft were armed with depth charges. Since it was impossible to change the setting of the detonator in flight, it was set for the average submersion depth of a submarine (in some squadrons this was considered to be 50 meters, in others--15 meters).
9. Blacket, "Operations Research," in THE ADVANCEMENT OF SCIENCE, 1948, Vol 5, No 17.

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## NAVAL FORCES

### EVALUATING EFFECTIVENESS OF DESIGNED SHIP

Moscow MORSKOY SBORNIK in Russian No 12, Dec 61 pp 67-73

[Article, title as above, by Candidate of Technical Sciences Yu. V. Skorokhod. Passages printed in boldface in source are set off in slantlines; italicized passages are set off in double slantlines]

[Text] As shipbuilding developed, as early as the end of the 18th century, shipbuilders and seamen faced the problem of using available technology to create a ship with the greatest combat effectiveness. One of the first attempts to answer this question from a theoretical standpoint was made by Chapman, who arrived at the following conclusion based on a study of statistical information. In order to give a ship the proper characteristics its water displacement  $D$  (which at that time was considered to be proportionate to the product of the ship's length  $L$  and the square of its width  $B^2$ ) must be related to the power of the armament, as expressed by the function

$$k = \frac{B^2 L}{2900 (n d)^{2/3}}, \quad (1)$$

where  $n$  represents the number of guns and  $d$ , the caliber of the guns.

The factor  $k$  here is a sort of numerical expression of the ship's effectiveness: When  $k > 1$  the ship's armament is inadequate, and when  $k < 1$  the ship is overweighed by weapons and is dangerous to sail.<sup>1</sup>

In the 19th century Okunyev, (Kolyu), Norman and others made repeated attempts to form type functions

$$k = f(n, d, t, i, \theta, v_s, R), \quad (2)$$

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1. F. Chapman, "Theoretical Reasoning on the Most Suitable Structure and the Proper Size for Battleships, as well as Frigates, and Other Smaller War Vessels," Stockholm 1936.

where  $i$  represents the rate of fire;  
t--length of continuous fire;  
 $\delta$ --armor thickness;  
 $v_s$ --traveling speed;  
R--sailing range,

to make it possible to compare ship designs.

A.N. Krylov pointed out the need for and the possibility of a scientific approach to the comparative appraisal of ship designs. In memoranda pertaining to the organization in 1908 of an international competition for best draft plan for a battleship A.N. Krylov wrote the following: "The large number of designs and variations submitted is forcing us to seek some sort of specific guidelines or a formula for judging them. This is essential also because only such a formula will make the judging of the designs completely unbiased, completely objective and uniform. An infinite number of such formulas could be established, with the following considerations in mind. With respect to the ship, certain characteristics could be considered direct, or positive--the number of guns and their total combined traverse, as an example, while others would be negative, or inverse--displacement, for example. It would be entirely a matter of accepting specific rules for grouping these individual quantities so as to derive a number expressing the appraisal of the entire ship as a complete structure. This grouping of quantities would be an entirely hypothetical and derivative process. Guidelines would have to be set for it, which would conform to the views and ideas held by the naval ministry with respect to a ship's combat capacity. It is clear from this that the following would have to be established specifically and precisely:

1. what features of the ship would need to be considered with respect to affecting the assessment of a design's relative worth;
2. what quantity would be used for gaging each of these features separately;
3. the method to be used for grouping these features;
4. the relative factors to be ascribed to those features which are given priority."<sup>1</sup>

By formulating the general principle for establishing the methods, A. N. Krylov stressed the need simultaneously to work out the guidelines for grouping the characteristics of a ship's specific features in the process of selecting an indicator characterizing the ship as an "entire structure," noting that "the entire matter will consist of this." Furthermore, A.N. Krylov pointed out the need for preliminary testing of such methods, should they be developed, using the examples of draft designs for an armor-clad battleship with a displacement of 19,900 tons submitted for consideration in 1906.

By the beginning of the 20th century the criterion had been developed for evaluating cargo and transport vessels: the cost per ton-mile, or the cost of hauling a single passenger a distance of one mile. Such indicators came into especially extensive use in the designing of tankers.

1. A.N. Krylov, "Judging the Designs Entered in the Competition: Notes," "Sobraniye trudov" [Collected Works], Vol I, Pt 1, 1951.

The type formula (2) was used prior to, during and after the end of World War II.

In contemporary ship design theory, in accordance with current views in this field, one has to consider the entire group of questions involved in specifying the components of the vessel being designed. Operating with the design theory, it is possible to create a ship design with a specific combination of features. Methods permitting us to determine whether a given a combination of features is the optimum from the standpoint of the ship's conformity to its intended purpose, that is, to achieve a well-based solution to the problem, are practically non-existent, however.

The urgency of the task of creating the most combat-capable ship has not decreased today, however, but, on the contrary, has increased considerably. The rapid rate of development of technology is increasing the possibilities for selecting various models of armaments, machinery and equipment, and consequently, the number of possible variations in the ship's design as well. In order to avoid wasting material outlays or making errors in plans for the construction of combat equipment, there must be scientifically based answers to the following questions.

In the stage of developing the operational-tactical assignment: By means of what weapons and what sort of carrier for the weapons (surface ship, submarine, aircraft or land-based installation) can the given tactical task be accomplished most effectively?

In the stage of developing the tactical-technical assignment: With what combination of ship's features can the given tactical task be accomplished most effectively?

In the stage of developing the draft design: Which of the alternative ship designs best meets the requirements of its designated purpose?

In the technical planning stage: What is the most expedient way of producing the structural elements in accordance with the decisions adopted on basic aspects of the ship's design?

The development of methods providing scientifically based answers to the above questions would make it possible to design a ship on the basis of precise sciences.

Our accumulated level of knowledge about ships and weapons, about the planning of production and scientific subjects and about the use of the theory of probabilities, mathematical statistics, mathematical logic and the theory of games in military affairs and technology permits us to attempt to accomplish the above tasks, specifically the task formulated by A.N. Krylov, from several different approaches than those used until now. In Soviet and foreign practice operations research methods are now being employed fairly frequently in both the national economy and in military affairs for performing such tasks, that is, tasks involved in selecting the optimal from among numerous possible solutions.

The following sequence of operations could be accepted for accomplishing the assigned task--that of developing methods for selecting the optimal ship's design from among existing alternatives:

1. the chief and basic requirements are established for the ship, and in accordance with these--the features which it must possess in order to conform to its designated purpose;
2. the criteria characterizing each of the main features are defined;
3. the connection between the ship's revealed main features is established. That is, a mathematical model of the entire process to be evaluated is created;
4. factors not taken into account in the mathematical study and their influence upon the end result are assessed;
5. the final conclusions are formulated.

V. I. Lenin's letter to A. A. Krzhizhanovskiy of 14 March 1920 on the GOELRO [State Commission for the Electrification of Russia] plan<sup>1</sup> states that the main criteria for appraising any engineering solution are the usefulness and suitability provided by it. Elaborating on this principle as applicable to the task under consideration, it can be concluded that the following three categories of requirements must be taken into account for making a proper decision on the design for this or that ship:

operational-tactical--characterizing the ship's effectiveness for accomplishing the tasks assigned to it;

technical-economic--describing outlays for the ship's creation;

operational-economic--describing outlays for the ship's operation.

In accordance with this every ship should be characterized by specific operational-tactical, technical-economic and operational-economic features.

The operational-tactical features of the ship are the decisive ones, since they determine the feasibility of creating it. In many cases, however, technical-economic or operational-economic features have determined the final decision on a ship's design. As of 1959, for example, according to the White Book on defense matters, it was considered that England was most in need of general-purpose aircraft carriers and nuclear-powered submarines. Because of England's straitened financial circumstances, however, it had to limit itself to modernizing its military aircraft carriers and building submarines with diesel-electric power units. Beginning in 1958, in order to reduce operating costs, the American command began to install diesel instead of steam turbines on the Dealey class of ships produced in small series for export since 1954.

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1. V. I. Lenin, "Sobraniye sochineniy" [Collected Works], 3d edition, Vol 24, p 364.

A ship's operational-tactical features are described by its combat productivity during its period of operation (we shall designate this indicator with the letter S).

For transport vessels, for example, it is the product of useful cargo capacity multiplied by sailing range; for fishing vessels--the product of the width, depth and length of the area searched within a unit of time; for antimine defense ships--the number of mines recovered before the ship is blown up, and so forth.

It is an extremely complicated matter to define the combat productivity of ships. This has only recently become possible, after the required amount of statistical information had been accumulated and methods involving the theory of probabilities and the theory of games developed. It follows from the above definition that combat productivity S represents the product

$$S = stn, \quad (3)$$

where s represents combat productivity per unit of time;

t--the number of hours a ship operates before it receives damage putting it out of commission;

n--the number of times a ship is damaged before it is finally put out of commission.

A ship's combat productivity per unit of time s is determined from the composition of its weapons and possibilities for their practical employment.

The number of hours a ship performs before receiving damage can be determined on the basis of the following considerations. It is now possible mathematically to describe the process of a ship's performance of its assigned tactical mission and to determine, taking possible counteraction efforts into account, the probability that it will accomplish the mission, and from this--the mathematical expectation of results (that is, the average anticipated result from the ship's period of service on combat status, expressed as the number of aircraft shot down, the number of submarines sunk, the number of mines recovered and so forth). Knowing a ship's full combat productivity S and its productivity per unit of time s, it is possible to arrive at the number of hours the ship will serve on combat status before being damaged:

$$t = \frac{S}{s} \quad (4)$$

The number of times a ship will be damaged before it is completely put out of commission, taking modern types of weapons into account, should be taken as the equivalent of 1. In certain particular cases, however, it may not equal 1, but will be arrived at from statistical or experimental data.

It is not difficult to see that the first factor in the formula (3) describes the power of the armaments, while the second and third factors describe survivability. In addition, taken together, they also describe the ship's maneuverability, since

they take into account the ship's possibilities for employing its weapons and for evading enemy attacks. With this approach to the matter, the ship as a platform, its weapons and protective equipment are regarded as a single combat complex, and all of its shipbuilding features are taken into account.

Only such factors as the political state and morale and the level of training of the personnel, the talent and resolve of the commanders and so forth are not taken into account for determining the values of  $S$  and  $t$ . These factors need not be taken into account for drawing up variations in the ship's design, however, since it is perfectly reasonable to assume that all the ships being compared will have identical personnel.

A ship's technical and economic features are described by the cost of a series-produced ship and the outlays required to set up production for one series-produced ship.

Construction costs consist of the following:

$$C_p = C_1 + C_2 + C_3 + C_4 + C_5 + C_6 + C_7 + C_8 + C_9 \quad (\text{thousands of rubles}), \quad (5)$$

where  $C_1$  represents the cost of materials;

$C_2$ --the cost of deliveries and interplant cooperative operations;

$C_3$ --wages of production workers;

$C_4$ --shop overhead;

$C_5$ --general plant overhead;

$C_6$ --the cost of goods delivered by subcontractors;

$C_7$ --the cost of individual outlays (the designing and production of models, tools, attachments and so forth);

$C_8$ --commercial costs;

$C_9$ --accumulations.

When the proper statistical information is available it is not especially difficult to determine the cost of constructing a ship. Determining the cost of deliveries from subcontractors is the most difficult part of the process.

It is somewhat more difficult to determine the cost of preparations for constructing a series-produced ship  $C_{p.p.}$ . One has to take into account the cost of designing the ship, scientific research and experimental design work, expansion and preparation of production and so forth. Available statistical information, properly processed, however, makes it possible to take this factor into account as well. When we know the number of ships in series  $m$  we can determine the cost of one series-produced ship  $\frac{1}{m} C_{p.p.}$ .

The above procedure for assessing technical and economic indicators does not take into account, or more precisely, takes into extremely approximate account, such factors as the cost of strategic materials, the workload of highly skilled personnel, the engagement of building docks and so forth. These factors must be assessed separately (with purely logical methods, for example).



The ship's operational and economic features are described by the cost of its operation per unit of time, indirect expenditures for the operation of one series-produced ship and the cost of restoration  $C_r$  after it has been damaged.

The cost of operating the ship  $C_o$  depends upon its operating state (standing at anchor, traveling between points, use for its basic designated purpose) and is determined with the formula:

$$C = \sum_{i=1}^l (C_c + C_{f1} + C_{sdam} + C_o), \quad (6)$$

where  $C_c$  represents the cost of maintaining the ship's crew per unit of time, including the cost of regular wages (taking into account all types of extra and supplemental payments over and above the basic wage), food and uniforms for all the personnel;

$C_{f1}$ --the cost of fuel and lubricants per unit of time;

$C_{sdam}$ --the specific depreciation allowances and maintenance costs per unit of time;

$C_o$ --overhead costs per unit of time;

$l$ --number of different operating modes for the ship.

We can see from the formula (6) that if we know the permanent manning table, the number of power units and their operating modes, as well as existing wage scales and supply standards, it is not difficult to determine the cost of operating a ship per unit of time.

It is more time-consuming to determine the amount of indirect costs  $C_i$  for operating one series-produced ship. The cost of storing spare parts and all types of supply, maintenance of bases and so forth, must be taken into account. This indicator can ordinarily not be taken into account on a practical level in the calculations.

The cost of restoring a ship after it has been damaged can be assumed as dependent upon the ship's construction cost. In World War II it was ordinarily considered feasible to repair damaged ships only if the cost of restoration work did not exceed 50 percent of the ship's construction cost.

In addition to the assumptions stimulated above to the effect that all of the ship's features can be categorized as operational-tactical, technical-economic and operational-economic, and that factors not taken into account in the indicators accepted cannot affect the basic correctness of the conclusions derived, we also assume that:

all of the ships compared are designed in accordance with regulations and standards currently in effect for designing, equipment and supply;

the conditions for comparison of all the alternative ship designs are identical;

values of  $S$  and  $t$  are calculated with the same degree of assurance of results (that is, with the same probability that the assigned tactical mission will be accomplished);

ship construction, operation and repair costs are assumed for identical conditions (that is, for the same period of time and for the same country).

The first of the main features discussed is a positive feature of the ship and is expressed in a specific numerical value of productivity. The second and third features, on the contrary, are negative features of the ship and are expressed in standard monetary units. This combination makes it possible to reduce the result to a specific value for the ship's productivity, that is, to an indicator (criterion) describing the cost of performing the assigned mission:

$$s = \frac{C_p + \frac{1}{m}C_{p.p.} + ntC_o + \frac{1}{m}C_{k.z.} + (n-1)C_v}{nts} \quad (7)$$

If the necessary statistical data is not available, the formula (7) can be simplified:

$$s = \frac{C_p + ntC_{k.z.}}{nts} \quad (8)$$

If the given combat ship cannot perform the assigned tactical mission and it is necessary either to consider the operation of a group of ships or the operation of systems of various combat means, formula (7) will take the following form:

$$s = \frac{\sum(C_p + C_{p.p.} + C_o + C_{k.z.} + (n-1)tC_v)}{\sum nts} \quad (9)$$

The proposed criterion of effectiveness is not universal, and it can be used for comparing designs of ships with a narrowly specialized purpose and of similar type or for comparing ships with respect to their performance of one of the tactical missions.

Conclusions as to the relative effectiveness of multipurpose ships for their performance of other missions require repetition of the studies and can produce contrasting results.

Formula (9) can also be used for developing ship- and boat-building programs.

The formulas derived satisfy all the requirements formulated by A. N. Krylov.

In design studies, when a large number of alternate ship designs are being considered, the values used in formula (7) are easily enumerated with the transferred similitude method. The formula's general form is convenient for use in calculations performed by means of electronic computers.

As Academician A. N. Krylov proposed, the set of methods we have discussed make it possible, with the availability of the proper statistical and experimental material, to compare various alternate ship designs "by number and measure" and to determine which of the alternative designs is the best. These methods can be used in all stages of ship designing.

11499

CSO: 8144/1040

## LOGISTICAL SERVICES AND SPECIAL TROOPS

### CHEMICAL DEFENSE TROOPS DISCUSSED

Moscow KRSNAYA ZVEZDA in Russian 1 Jul 82 p 2

[Responses to a letter to the Editor: "The Relay Race Baton is Being Passed on to the Rising Generation: Comments on a Letter"]

[Text] Dear Editors:

Our older son Ondasyn has completed his service in the ranks of the Armed Forces of the USSR.

He told us proudly that his military specialty is that of a chemical scout and that he served in a chemical defense subunit. When the time comes, our younger son Murabkali also will join the army. Perhaps he will have to serve in the chemical troops, too. Could you describe these troops in some detail?

Respectfully yours,

Zhanym and Bitan Balabayev  
Opornaya Station  
Mangyshlaksкая Oblast  
Kazakh SSR

Our correspondent visited the subunit in which Ondasyn Balabayev had served. Below is his report.

Report by Lt Col M. Malygin, KRSNAYA ZVEZDA correspondent:

A special vehicle equipped with reconnaissance gear and monitors for detecting radioactive and chemical contamination moved along the prescribed route. The chemical scout squad commanded by Sgt A. Perov was carrying out an independent mission.

The subunit commander Sr Lt V. Gorodnov assigned that mission to the squad, being familiar with the high degree of their tactical special training. It should be especially emphasized that every member of the squad is a highly trained specialist, Komsomol member, and superior athlete.

The exercises began. The semiautomatic chemical reconnaissance instrument (PPKhR) was triggered. That was a signal that the "foe" used toxic substances (TS). The chemical scout jotted down the locus and time of detection and rapidly identified the type of TS. Immediately afterward he readied a target sign.

The vehicle stops on a roadside. Practice firing at the target sign is carried out.

The actions of the scouts are well-coordinated. Each can take over a comrade's duties as the need arises. Combined-skills training and complete mutual interchangeability of squads is a tradition of the subunit. Pvt Bitanov [Ondasyn Balabayev], for example, not only was highly competent in radiation and chemical detection but also could drive the vehicle. And the regular driver Pvt I. Ulmanis can operate the special instruments at the level of a high-class specialist. The weather observer Pvt Ye. Il'ushechkin and the driver-electrician Pvt N. Sergeytsev both have training in several related skills.

The squad continued its mission to perform reconnaissance of the region of contamination and determine the ways of bypassing and surmounting that region. Sgt Perov radioed information to Lt I. Vasil'yev. On the basis of data transmitted by the chemical scouts, the commander decided to cross the region of contamination upon selecting the most expedient directions of action of the subunits and taking measures to protect the personnel.

The conditions of action of the scouts were complex. But then there are no easy travel routes for chemical-defense subunits. The fulfillment of every mission assigned to chemical scouts requires of them unflagging alertness and a high feeling of responsibility.

...They returned to the base in the evening. Pine trees line the base roads and there are flowerbeds and universal neatness. At the clubhouse door there is posted an announcement of a soiree devoted to the 60th anniversary of establishment of the USSR. I was told that Pvt Ulmanis was going to deliver a speech there. He has something to say. He will also describe how Pvt Bitanov had steadfastly helped him to master his military specialty. In the army he, like all other personnel of the formation, representing more than 30 of the country's nationalities, each day senses the full impact of the strength of friendship and military comradeship.

\* \* \*

#### Commentary on the Above Letter and Report

On the Editors' request, Tech Lt Gen S. Bol'shakov comments below on the letter of Zh. and B. Balabayev and the report by our correspondent.

Chemical scouts carry out, along with other military specialists serving in the subunits and formations of chemical troops, a responsible mission: they assure reliable protection of troops during operations attended by radioactive and chemical contamination.

Let me briefly recount the history of chemical troops.

During the very first years of existence of our army the formation of these troops became a necessary or rather forced measure in response to the threat of the use of toxic substances by foreign interventionists.

The Communist party and Soviet state took active steps to prohibit the use of chemical weapons and other similar means of warfare.

But they met with opposition from the imperialist states, which have broadly developed work on new and more lethal toxic substances and means of their application. In such a situation the USSR was forced to take steps to increase the readiness of its Armed Forces to operate in the presence of chemical warfare by the foe. During the Great Patriotic War chemical-defense formations and subunits were used, for example, to produce smoke curtains. For the courage and bravery they manifested in combat, 22 chemical-defense fighting men were awarded the high honorific of Hero of the Soviet Union while 31 flamethrower units and 9 chemical-defense battallions were awarded honorific designations.

The need to improve chemical troops in the postwar period is due to the fact that the coalition of imperialist states united in the NATO bloc and headed by the United States has sharply speeded up the arms race and developed new weapons of mass annihilation. The United States Administration has approved a "chemical rearming" program. As pointed out at a press conference held in March of this year for Soviet and foreign journalists at the USSR Ministry of Foreign Affairs, this concerns developing the potential for conducting aggressive chemical warfare.

At the press conference, in response to the slander of Soviet chemical troops that is widely practiced in the West, it was distinctly stated that Soviet chemical troops are intended not to use chemical weapons but to fulfill tasks to protect troops against the foe's chemical and nuclear weapons.

The formations and subunits for chemical defense and radioactive and chemical reconnaissance are equipped with up-to-date instruments and gear.

The Exercise "Zapad-81" [West-81] became a veritable school of skill and courage to chemical-troop personnel. Many of them were decorated with distinguished state awards. They also include O. Bitanov's service comrades. The medal "For Distinction in Military Service" was awarded, for example, to Pfc S. Chozhonov, who recently transferred to reserve status. Others receiving decorations were Sr Lt V. Sayapin and Ensign A. Kosyakov. The formation in which Pvt O. Bitanov had served was judged to be one of the best in the socialist competition for the winter period. The personnel of that formation worthily multiply the combat traditions of their twice Order-bearing formation which was repeatedly decorated and awarded a honorific designation during the Great Patriotic War.

1386

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## PERCEPTIONS, VIEWS, COMMENTS

### COMMENTS ON ACTIVITIES OF U.S. IN INDIAN OCEAN AREA

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 12, Jun 82 (signed to press 3 Jun 82) pp 84-89

[Article by Col Yu. Sedov: "The Indian Ocean: Intrigues of Imperialism and Reaction"]

[Text] Icy "cold war" winds blowing in from the side of the North American continent have led to serious "chilling" of the international climate. The Reagan administration, in which outright "hawks" are setting the tone, is attempting to achieve military-strategic superiority over the Soviet Union so that by relying on the force of arms it could impose its will upon other countries and resolve many international problems by the methods of dictatorship. Ignoring the realities of the modern world, the aggressive circles of imperialism, and mainly American imperialism, are spiraling the arms race upward on an unprecedented scale, and they are showing no subtlety in enhancing their military presence in different regions of the globe, which has been declared a sphere of "vital interests" of the United States almost in its entirety.

The sharply growing militaristic activity of the USA in the Indian Ocean basin is closely related to the general drift of Washington's policy in the direction of "cold war," sharper confrontation with the socialist world and subversion of the movement of national liberation. The imperialists are striving to utilize this region to deploy their armed forces with the purpose of upsetting the evolved strategic balance in the world, and as a springboard for attacking or threatening an attack upon the Soviet Union. It is considered in this case that some areas of the Indian Ocean and the territory of coastal states are rather close to the USSR, and at the same time so far away from the USA that it would be practically impossible to create an equivalent counterthreat to the United States with the purpose of maintaining the military-strategic balance. R. Paone, one of the Pentagon strategists, openly declared that the Indian Ocean, and especially the Arabian Sea, is "a geographically ideal region for actions by American atomic missile submarines in an attack on central Russia."

Washington is also considering the growing influence of coastal states in international affairs, and it is closely watching their political course from the standpoint of the ratio of forces between socialism and capitalism. The 36 states of the Indian Ocean basin represent about a third of the developing world and almost a fourth of the UN membership; more than a billion persons

reside in these countries. The avaricious gazes of imperialist predators are riveted to the Indian Ocean also because this is the location of a highly rich larder of natural resources. About 65 percent of the explored reserves of petroleum and uranium, more than half of the reserves of gold and almost all of the diamond mining of the capitalist world are concentrated in this region. In the last decade oil imports by the United States from Southwest Asia increased by about 1.5 times, reaching 34 percent of total petroleum imports. American investments in the region have exceeded \$10 billion. Great Britain has invested about 60 percent of its foreign capital in this area. Each year 800 million tons of petroleum are carried from the Persian Gulf on marine water routes, satisfying 60 percent of West Europe's demand and 90 percent of Japan's demand.

Imperialism's hostility toward sociopolitical changes in the Indian Ocean zone and the fear of losing control over minerals is one of the principal factors responsible for initiation of peace-endangering militaristic preparations in this portion of our planet by the ruling circles of the Western powers, primarily the United States. "No matter what propaganda tricks the Washington administration resorts to, no matter what grounds it produces to camouflage its policy," declared Indian Member of Parliament D. Chakrabortari, "the essence of the issue boils down to the same thing: the USA's aspiration to transform the Indian Ocean into an 'American lake,' to encircle it with military bases on all sides, to exert pressure upon the coastal states, and in the final analysis to assume power over their natural resources and dispose of them without control."

Washington is attempting to justify unprecedented growth of provocative activities in the Indian Ocean zone by events occurring in Afghanistan and Iran. However, the history of American military penetrations into this region dates back more than just a single decade. Pentagon strategists began thinking about adventuristic plans of establishing control over the ocean basin immediately after World War II, and they began implementing them right away. By as early as 1948 a U.S. naval command was formed in the Middle East consisting of three or four ships (based at Bahrein), which are still functioning in the Persian Gulf. In early 1964 ships of the Seventh Fleet appeared for the first time in the Indian Ocean, and aircraft carriers began entering the area in 1970.

Following the failure of imperialist aggression in Indochina the United States declared the so-called "Nixon doctrine," according to which "protection of American interests" in a number of regions of the globe was delegated to Washington's satellites; the latter were given the responsibilities of performing police functions. By that time Great Britain's military presence in the Persian Gulf was waning, and a decision was made from across the ocean to place all bets on the Shah's regime in Iran, which began to play a triple role: watchman of imperialist interests in the region, an important supplier of oil, and a major weapon purchaser. Soon after, however, the "Nixon doctrine," which foresaw a "low profile" for America in different regions of the world, suffered failure in response to the blows of popular national liberation movements. Washington became persuaded that massive deliveries of arms to pro-West regimes and the sending of American military advisers cannot guarantee dependable "protection of the USA's national interests." "The fall of the Shah's regime in Iran necessitated comprehensive reexamination of the Nixon doctrine," asserted the newspaper THE NEW YORK TIMES.



This was soon followed by the appearance of the so-called "arc of instability," invented by the former U.S. presidential assistant for national security Z. Brzezinski. The "Carter doctrine" followed a little later. These were "justifications" for military activity in the Indian Ocean and for the USA's right to use military force against the peoples of coastal states striving to follow the path of liberty and social progress. Forgetting the lessons of Vietnam, the White House began forced growth of military presence in the region. This turn in policy reflected U.S. imperialism's aspiration for preserving its positions in the Indian Ocean basin in the new conditions at all costs. This was a time when India, which was pursuing a peace-loving foreign policy course, was exerting an increasing influence in the international arena, when Pol-Pot bands were defeated, when the aggressive CENTO and SEATO blocs collapsed and when revolutionary events occurred in Iran and Afghanistan.

Realizing its aggressive plans, Washington is taking a number of actions oriented mainly at utilizing military force. I am referring primarily to formation of the "rapid deployment forces" with their police functions, creation of a fleet permanently deployed in the Indian Ocean and encouragement of coastal states, with military and economic "aid," to participate in various sorts of military-political groupings. Efforts were also made to incite local conflicts. "In justification of such actions," pointed out Comrade L. I. Brezhnev, "they are spreading the lie of a 'Soviet threat' upon the rich oil deposits of the Near and Middle East or the oil transportation routes. This is a knowingly false accusation, since its authors understand quite well that the USSR has no intention of transgressing upon either one or the other. And in general, it would be absurd to think that the oil interests of the West could be 'protected' by transforming this region into a powder keg."

The Persian Gulf is in the center of attention of imperialist circles. Western monopolies are dreaming of becoming the full masters of this highly rich petroleum larder, where annual extraction exceeds 1 billion tons. One of the measures having the purpose of establishing control over "black gold" is concentration of more than 30 American ships in the Arabian Sea. This is not simply a "demonstration of the flag," but the placement of a material foundation beneath the aggressive policy of U.S. imperialism and creation of the machinery for interfering in the internal affairs of the states of Asia and Africa.

Dangerous activities of the American war machine in the Near East are directly associated with the USA's militaristic preparations in the Indian Ocean. The Pentagon obtained new possibilities for increasing its military presence in the region as a result of pledges taken by the United States to serve as the guarantor of "peace" in compliance with the separate Egyptian-Israeli deal made at Camp David. In particular the USA has been given the right to use military bases on Israeli and Egyptian territory, and Washington will supply its partners with weapons to perform their police functions.

Yet another step on the road of widening U.S. military presence in Southwest Asia was the deployment of American troops on a permanent basis on the Sinai Peninsula under the guise of "multinational forces" as of April 1982. These forces have the mission of "observing" fulfillment of the conditions of the separate Egyptian-Israeli treaty. As is noted in the journal NEWSWEEK,

Washington intends for sizeable military contingents of the Pentagon, which will periodically replace one another, to "break themselves in" to the conditions of the Near East region as part of "multinational forces."

Using the figurative expression of the journal AFRIK-AZI, the United States is attempting to encircle the Persian Gulf with a loop of aggressive strongpoints extending from the island of Diego Garcia, through Oman, Israel and Egypt to Somali and Kenya. Oman, which assumed the role of Persian Gulf "watchman" upon itself, has displayed the greatest pliancy in relation to pressure from Washington. Owing to its exceptionally advantageous geographic position giving it control over the Strait of Hormuz, the foreign press refers to the former British colony of Oman as the "gemstone" of the Near East arc of Pentagon strongpoints. In exchange for arms, Sultan Qaboos placed five military facilities at the disposal of the United States, to include air force bases on the island of Masira, at As-Sib and (Markiz-Tamrida) and the port facilities at Matrah and Risut. The facilities on Masira and at As-Sib are already being used extensively today to supply the armadas of American ships concentrated in the Arabian Sea and Persian Gulf. The base on Masira is now being modernized and adapted for B-52 strategic bombers. The Pentagon has deployed E-3A long-range radar detection and control aircraft carrying the AWACS system on the territory of Saudi Arabia. These airplanes are monitoring the situation in the vicinity of the Persian Gulf, and they are capable of controlling aviation of the "rapid deployment forces" in the region.

Kenya, which has placed the port of Mombasa and a number of military facilities in the country's north at the USA's disposal, is also in the mainstream of Washington's policy. In Somali the United States traded for the right to use the naval base and airfield at Berbera and the port facilities at Mogadishu, as well as the airfield at the outlet from the Red Sea. In exchange the Somali regime is receiving American arms, which is encouraging the predatory aspirations of Mogadishu in relation to Ethiopia.

The USA built a large naval and air force base on the island of Diego Garcia (the Chagos Archipelago) located in the center of the Indian Ocean. This archipelago was "surgically" removed from the state of Mauritius in 1965 by Great Britain, which "leased" it to the United States until the year 2016 together with the island of Diego Garcia located within it. Despite protests from Mauritius, which is supported by countries in the Organization of African Unity and by a number of other states, this island has been transformed into an "unsinkable aircraft carrier" of the United States and the main outpost of American ships and "rapid deployment forces" located in the region. It has been given the role of the binding link in the system of strongpoints created by the Pentagon in the Pacific Ocean, Africa and the Near East. Reports published by the foreign press show that use of the base on Diego Garcia will make it possible to increase the time atomic submarines of the U.S. Navy could remain in the ocean by a factor of two, and a ship departing from the island would be able to reach the most remote corner of the Indian Ocean within 2 days.

Pentagon strategists believe that increasing the American military presence and expanding the network of bases in the Persian Gulf zone is only the first

step on the road to establish military control over this region. The role of "armored fist" is given to the "rapid deployment forces," the main mission of which is, according to the cynical expression of one of their leaders, "to keep the developing countries from slipping through American fingers." According to a report in the journal PROCEEDINGS, they will initially consist of the 82d Airborne (15,200 men) and the 101st Airborne divisions (17,900 men) which have had experience in aggressive warfare in Vietnam, as well as other units and subunits. The strength of the most mobile component of the "invasionary troops" is to be raised to 100,000-110,000 men, and the total strength is to be over 300,000.

Preparing for punitive operations in Southwest Asia, the Pentagon is conducting numerous troop exercises in conditions maximally similar to those which they may encounter in countries of the region. Units and subunits of the "rapid deployment forces" regularly "play war" on the territory of the American states of Nevada, Virginia, Florida and California. Maneuvers of the "invasionary troops" were conducted at the end of 1980 and in November 1981 in Egypt, which the USA wishes to transform into a proving ground for preparation of interventionist operations of the Pentagon against states of the Near and Middle East.

According to the foreign press certain new factors have appeared in viewpoints on the use of the "rapid deployment forces" with the Reagan administration's occupation of the White House. The most important changes, notes the JOURNAL OF COMMERCE, include "strengthening the accent on supporting deployment of permanent ground and air forces in Southwest Asia in connection with the present shortage of transportation resources for transferring mobile components." It is with this purpose that the Pentagon intends to form a separate independent "rapid deployment force" command and locate it in one of the countries of the region.

Efforts associated with deployment of "multinational forces" on Sinai are an organic part of the hegemonistic policy of the Reagan administration aimed at expanding American military presence in Southwest Asia. These forces are viewed as the forward detachment of "invasionary troops."

The new variant of the "rapid deployment forces" are to be supplied with nuclear and chemical weapons. The Pentagon's nuclear weapons administration, the JOURNAL OF COMMERCE reports, is already studying the possible "consequences of nuclear explosions in regions outside of Europe, with the accent on Southwest Asia." One of the first forms of arms which are to be tested with the purpose of studying the possibilities of transferring them by air is the Lance missile, which is capable of carrying a nuclear warhead. It is also stated that the Pentagon is thinking about "using the neutron weapon as a means of recapturing oilfields without doing them material harm." To annihilate people and seize deposits of petroleum and other minerals--such are the misanthropic designs of American imperialists.

Under the excuse of "protecting the oil delivery routes," Washington is extending the zones of responsibility of the aggressive NATO and ANZUS blocs and Japan into the Near and Middle East, which is the old plan of creating a system of "collective colonialism." Under pressure from the USA, a provision making

it possible to deploy bloc forces "outside the NATO region" was included in the final communique of the Rome session of the NATO council. The government of Great Britain, which has declared its consent to include British contingents in the composition of American "rapid deployment forces," is displaying the greatest activity in this issue. The general plan calls for organizing united NATO "rapid deployment forces" with police functions. As the DAILY TELEGRAPH put it, these forces "will become the NATO flagship, extending the bloc's zone of responsibility to the borders of Iran and Afghanistan."

Participation of Western powers in the militaristic preparations in the Indian Ocean zone has the purpose, according to Washington's plans, not only to lighten the burden created by the significant expenditures associated with such preparations, but also to impart a collective nature to the escalation of the military presence, which would be advantageous to the United States from a propaganda point of view.

Pakistan has been enjoying extremely close attention from American leaders in recent years, especially after the fall of the Shah's regime in Iran and the revolution in Afghanistan. According to estimates of the Pentagon, Pakistan may serve as a convenient transloading point in operations of the "rapid deployment forces," and it could serve as a base for concentrating reserves of military equipment. Washington is making broad use of Pakistani territory today as a springboard for undeclared war against Afghanistan. According to the foreign press about 30 military camps and 50 strongpoints intended for the simultaneous training of 5,000 hired assassins being sent into the Democratic Republic of Afghanistan have been created here. These men are being trained by instructors from Pakistan, the USA, China and Egypt. The bandits are being supplied with American, Chinese and Egyptian weapons.

The U.S. administration has adopted a 5-year program of arming Islamabad. There are plans for supplying 40 F-16 fighter-bombers, 400 M-60 tanks, 500 armored transporters, 100 helicopters and other modern equipment to Pakistan. Some of these arms are intended for renegades operating against Afghanistan. In exchange for weapons, the Pentagon hopes to obtain military bases in Karachi, Gwadar and Peshawar for the "rapid deployment forces" and for storage of heavy armament.

The plans of the United States for massive deliveries of arms to Pakistan are becoming especially threatening on the background of the provocative course of Islamabad in relation to India. It is recalled in New Delhi, not without grounds, that weapons in the hands of the Pakistani war machine had already been directed against India in 1965 and 1971. And now the bulk of the Pakistani armed forces are concentrated mainly on the Indian border, and the country's bourgeois press has initiated brazen propaganda against India. It should be recalled that Islamabad continues to occupy a part of the Indian state of Jammu and Kashmir, where the largest number of border incidents provoked by the Pakistani side can be noted. Also deployed in this region are troops from China, the anti-Indian orientation of which is constantly growing. In this connection the newspaper CHRISTIAN SCIENCE MONITOR wrote that New Delhi's concern about deliveries of arms to Pakistan becomes a "dual" concern when "Washington negotiates on providing arms to China, thus creating the danger of encircling India by a Chinese-Pakistani alliance supported by the United States."

Continuing to occupy 36,000 square kilometers of Indian territory and holding a claim on another 90,000, Beijing is concentrating its troops along the border with India, it is building a network of military bases and strategic roads here at an accelerated pace, it is provoking border incidents, and it is supporting separatist movements in the northern regions of India. The Chinese leadership is participating more and more actively in militarization of Pakistan, having already furnished weapons to it worth over \$2 billion. Recently these countries have also organized "cooperation" in the construction of war plants, military bases and strategic roads. The hegemonistic plans of Beijing allocate to Pakistan the role of a springboard providing access to the Indian Ocean. Also serving these goals is the Karakoram highway, built with the assistance of the Chinese Peoples' Republic. This highway is being used to convey troops and deliver weapons to Islamabad. "Using Pakistan," notes the newspaper NATIONAL HERALD, "the Chinese rulers are trying to intensify their influence in Southwest Asia and acquire advantageous positions at the approaches to the rich oil of the Persian Gulf."

This expansionist force of the Maoists in the Indian Ocean basin, who have territorial claims upon many states of Asia, is eliciting serious alarm among the people residing in this area. As we know, China, which is striving to become the "dominant power" in the region, is responsible for 19 of the 30 conflicts that have occurred on the Asian continent since World War II. It is now increasing its naval power in the southern seas, and its naval forces have doubled in the last decade. Beijing is persistently attempting to obtain military bases in Pakistan, Sri Lanka, Tanzania and a number of other states.

Typical in this respect is China's position in relation to the proposal by peace-loving states for transforming the Indian Ocean into a zone of peace. While supporting it in words, Beijing is actually aligning itself with imperialism, striving to do everything it can to complicate the situation in the region. The Pacific command of the U.S. Navy has even expressed confidence in the possibility of future American-Chinese military cooperation in the Indian Ocean. There obviously are grounds for such confidence. After all, the partners are already working together in relation to Pakistan, Afghanistan, India and Iran. Beijing is actually supporting forced military preparations of the American war machine on the island of Diego Garcia and in a number of coastal states, and it is arguing in favor of permanent military presence of the USA in the Indian Ocean.

Washington is devoting increasingly greater attention to countries of Southeast Asia and the Far East, the territories of which should become, according to Pentagon plans, springboards for the transfer of troops from the Pacific Ocean to Southwest Asia. Japan is given a special place in these adventuristic plans. According to a report in the newspaper SANKEI SIMBUN, one of its particular tasks is that of providing logistical support to American actions in the Indian Ocean by way of furnishing vessels and civil aircraft for troop transfers and, if necessary, by sending ships to this region. American military rulers are also thinking about creating a permanent naval formation consisting of ships from countries of the Pacific Ocean zone, to include Japan, for the purposes of patrolling the Pacific and Indian oceans. The territory of the Japanese island of Okinawa is essentially a supply base for American forces performing police functions in the Persian Gulf region.

The Pentagon also plans to make Australia a transloading base for "rapid deployment forces." There are more than 20 American military facilities there. B-52 strategic bombers flying from the island of Guam to Southwest Asia have been actively using an air force base near Darwin since 1981. Canberra has obediently allocated the port of Cockburn Sound on the coast of the Indian Ocean for the basing of American ships, including aircraft carriers and atomic submarines, and it has shown support for expansion of the American base at Pine Gap--the largest center of radio and radiotechnical reconnaissance. The Australian government is prepared to support all of Washington's proposals for the ANZUS bloc, which is now targeted primarily against the Indian Ocean.

The Philippines are called the "trampoline for adventures" in the foreign press. For several decades now two of the largest bases, Subic Bay and Clark Field, as well as other military facilities have been serving United States imperialism as the springboard for expansion on the Asian continent. It was from the base at Subic Bay, which is a large repair and fueling point for ships of the Seventh Fleet, that 1,800 marines were sent to the Indian Ocean to protect the "vital interests" of the USA. Following its modernization, it is to become the home port for ships of the Fifth Fleet, now being created in the Indian Ocean. It is namely from these two bases that U.S. Armed Forces were dispatched into the Persian Gulf region to blockade Iran. Recently a certain highly placed colleague of the State Department openly declared that the USA's capability "for extending military power across the Pacific to Southwest Asia" depends directly on whether or not Washington can retain its "right of unhindered use" of American bases on the Philippines.

Growth in the militaristic activity of the United States in the Indian Ocean basin is accompanied by a broad diplomatic offensive being waged by Washington with the purpose of sabotaging all attempts by peace-loving forces to transform this region into a zone of peace. This dangerous position can be explained primarily by the fact that any progress in solving the problems of demilitarizing the Indian Ocean would create a serious breach in the aggressive global plans of imperialism. Thus in February 1978 the USA unilaterally broke off Soviet-American negotiations started on the USSR's initiative to limit and subsequently reduce military activities in the Indian Ocean. As the journal NEWSWEEK admitted, this was done with the purpose of "untying our hands" for the purposes of activating militaristic preparations on a large scale in this region.

Conspiring with some allies of military blocs and with its Beijing accomplices, Washington scuttled plans for holding an international conference in 1981, called for by a UN decision and having the purpose of implementing a declaration of the General Assembly on transforming the Indian Ocean into a zone of peace. As we know, this declaration includes fundamentally important issues such as eliminating foreign military bases from the Indian Ocean, prohibition of the deployment of nuclear weapons there, cessation of the escalation of military presence of noncoastal states, renunciation of any attempts at threatening the security of countries of the Indian Ocean, and free and unhindered use of the waters of the ocean by vessels of all states, in compliance with the principles and rules of international law.

As far as the Soviet Union is concerned, it not only supports the idea of transforming the Indian Ocean into a zone of peace, but it has also submitted important proposals aimed at achieving this end. In contrast to the USA, the USSR does not possess military bases here, it has no intentions of acquiring them, and it is not increasing its military presence in the region. The motherland of October has no designs upon foreign wealth, it is not seeking concessions, and it has no investments which could produce profit at the price of exploiting foreign natural resources and manpower. Economic cooperation of the USSR with countries of Asia and Africa is organized on an equal and mutually advantageous basis.

But at the same time the Soviet Union is far from indifferent to the military-political situation in this important region. To the USSR, creating a zone of peace in the Indian Ocean means strengthening international security and satisfying national interests. The Soviet Union is concerned first of all with averting the arising of a strategic threat to itself from the south as a result of the unwise policy of aggressive circles of imperialism and reaction. As with all continental states, our country is interested in the security of marine communications in the Indian Ocean, since not only do they connect us with the coastal states, but they also represent the sole marine route open year-round connecting the European USSR with its Far East ports. We are also engaged in a significant amount of scientific activity in this area. Finally, there are many states in the Indian Ocean region with which the USSR has established and is now maintaining friendly relations.

The Soviet Union opposes imperialistic dictatorship with a consistent policy of peace, having proposed a constructive program of ensuring the security of the Persian Gulf zone and the approaches to it. This policy was once again confirmed by the 26th CPSU Congress. "Instead of drawing more and more new naval and aerial armadas, troops and armament into that area," notes the Accountability Report of the Central Committee to the 26th CPSU Congress, "we propose relieving the military threat by signing an international treaty. By joint effort and with regard to the legal interests of all sides, we can create a situation of stability and calm in this region. We can guarantee the sovereign rights of the region's states and the safety of marine and other lines of communication connecting it to the rest of the world." In his response to a letter from an Australian organization promoting international cooperation and disarmament, in February 1982 Comrade L. I. Brezhnev again confirmed the Soviet Union's readiness to resume, at any time, negotiations with the USA on limiting military activity in the Indian Ocean.

At the 17th Congress of USSR Trade Unions, in speeches at the celebrations in Tashkent and at the 19th Komsomol Congress, Comrade L. I. Brezhnev forwarded new important proposals on bridling the arms race and averting the threat of a new world war. Indicating in particular the Soviet Union's readiness to negotiate on mutual limitation of naval actions, the head of the Soviet state declared: "...we would feel it possible to agree that the missile submarines of both sides should be removed from the present vast regions of combat patrol and that their cruising should be limited to mutually agreed upon boundaries. We would also be prepared to discuss the issue of extending measures of trust to the seas and oceans, and especially to those regions through which the busiest marine routes pass. In a word, we are in favor of making the largest possible part of the World Ocean a zone of peace in the immediate future."

At the end of April of the present year an international conference titled "Indian Ocean--Zone of Peace," convened on the initiative of the World Peace Council, the Organization of Solidarity of the Peoples of Asia and Africa and a number of other international organizations, completed its work in New Delhi. Representatives from more than 50 countries participated in it. The Declaration on the Indian Ocean, unanimously adopted at the conference, notes that the military preparations of the USA in this region are a serious threat to the peace and security of not only the coastal states of Asia and Africa but also the entire world. The problem of the Indian Ocean has now become the problem of increasing penetration of NATO into other regions of our planet.

The conference gave a high evaluation to the Soviet Union's new proposals on transforming a significant part of the World Ocean into a zone of peace and the proposal to stabilize the situation in the Persian Gulf, suggested by L. I. Brezhnev.

The unceasing aggressive militaristic preparations of the forces of imperialism and reaction in the Indian Ocean and in other regions of our planet require the soldiers of the USSR Armed Forces to intensify their political alertness, continually improve their combat proficiency and maintain constant readiness to offer an annihilatory repulse to any intrigues of the enemies of peace.

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